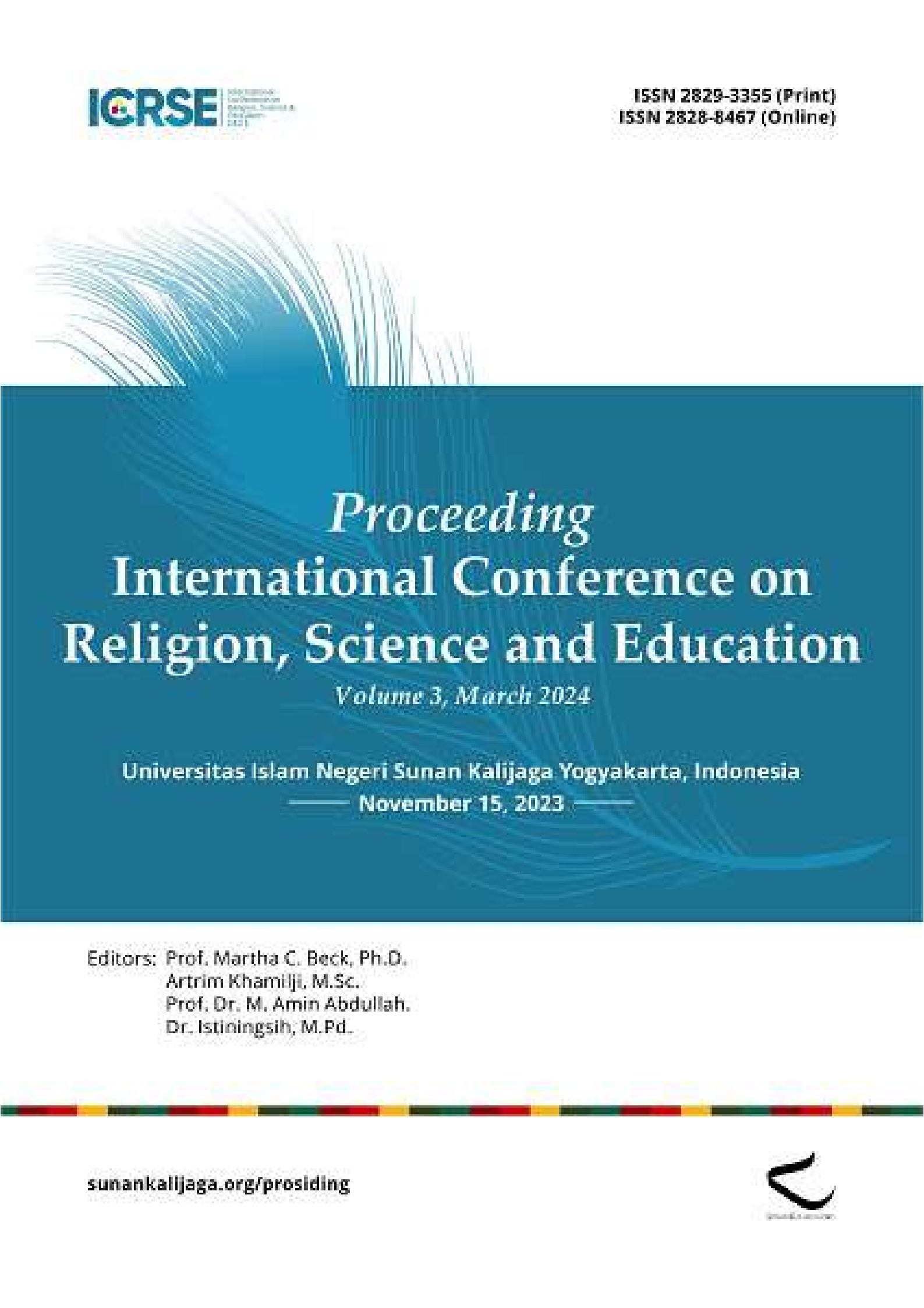




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Bibliometric Review of Research Trends in Artificial Intelligence in Education

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Abstract: This study provides an overview of research trends in the application of Artificial Intelligence (AI) in education over the period 2019-2023. Through a bibliometric review of 3000 publications in the Scopus database, we identified several key focus areas including personalization of learning, data mining, and ethical and practical challenges in the application of AI in education. Results show a growing interest in these topics with an increasing number of publications each year. While this study provides important insights, there are limitations such as limited data sources on Scopus and challenges in classifying and interpreting certain data. The findings show potential for further research on how to apply AI in education as well as implications for educational practitioners.

Keywords: Artificial Intelligence, Education, Bibliometrics, Trend

Introduction

Artificial Intelligence (AI) is a branch of computer science that focuses on the creation and application of systems that mimic the functions of human intelligence. As explained by Russell & Norvig (2016), AI involves the use of advanced algorithms and technologies to enable machines to perform tasks that would normally require human thought, such as problem solving, pattern recognition, and learning from experience.

In recent decades, AI has evolved to become an integral part of various sectors including education. In the context of education, AI has the potential to transform the way we teach and learn. For example, through personalization of teaching - where AI systems can tailor subject matter according to students' individual needs - automation of assessment - where AI systems can quickly and accurately grade student work - and facilitating technology-based learning - where students can learn anytime and anywhere using digital platforms (Luckin et al., 2016).

However, despite this huge potential, there are still many questions about how best to apply AI in education. It is therefore important for us to understand the research trends in this field. Understanding these trends helps us identify key research areas as well as future challenges and opportunities in the application of AI in education (Baker & Yacef, 2009).

The purpose of this bibliometric review is to provide an overview of the development of research trends in the application of AI in education. Through analyzing the scientific literature on this topic over a period of time, we aim to find out the main focus areas of previous research as well as the methodologies used by researchers. The future development of this field of study will also be presented.

Materials and Methods

Study Area:

This research focuses on the application of Artificial Intelligence (AI) in education. AI has

become an integral part of various aspects of education, from teaching and assessment to curriculum development and administration. As such, this research covers a wide range of educational contexts, including primary and secondary education, higher education, and professional training and development.

Data Collection:

To conduct this bibliometric review, we used the widely recognized Scopus database for academic research. The search keywords used were "Artificial Intelligence" and "Education". These search criteria were chosen to ensure that all literature relevant to our research focus was included in the review. The time span for the search was publications between 2019 and 2023, allowing us to see the development of recent trends in AI research in education.

Data Analysis:

After data collection, analysis was conducted in several ways. First, a citation analysis was conducted to determine the extent to which each article has been influenced by other work in the field. This gives us an idea of the relevance and impact of various studies (Zawacki-Richter et al., 2020).

Second, content analysis was conducted on the title, abstract and keywords of each article. The aim was to identify the main themes and subthemes in the literature (Baker & Yacef, 2009). This helps us understand what topics are most frequently covered by researchers as well as how understanding of those topics has evolved over time.

Third, collaboration analysis was conducted to identify patterns of collaboration between authors and institutions (Russell & Norvig, 2016). This is important because collaboration is often an important indicator of scientific innovation.

Fourth, a journal analysis was conducted to find out which journals most frequently publish articles on AI in education. This gives us a better understanding of which journals are at the center of academic discussions on this topic.

Research Procedures:

The research process began with the identification of search keywords ("Artificial Intelligence" and "Education") and database selection (Scopus). Next, we conducted a literature search using these keywords, limiting the search to publications between 2019 and 2023. After data collection, citation, content, collaboration, and journal analysis were conducted to identify key research trends.

In conducting this analysis, we used various statistical tools and techniques to understand patterns in the data. For example, we use cluster analysis to identify groups of articles that are frequently cited together. We also used data visualization techniques such as citation maps and network diagrams to help us understand patterns and relationships in the data.

Results and Discussion

Descriptive Statistics:

In the five-year period between 2019 and 2023, we conducted an in-depth analysis of the Scopus database and found a total of 3000 publications focused on "Artificial Intelligence" and "Education". This database includes publications from researchers around the world, contributing to the global knowledge in this field.

Analyzing the annual trend in the number of publications, we can see that there is a consistent increase each year. In 2019, there were about 400 publications. This number increased to around 500 in 2020. This positive trend continued with around 600 publications found in 2021 and rose again to around 800 in 2022. By the end of our observation period in 2023, the number of publications peaked at around 700 in total.

The consistent increase in the number of publications indicates a growing interest in the application of artificial intelligence in education. This may be due to technological advancements as well as the recognition of artificial intelligence's great potential to personalize and improve the efficiency of the teaching-learning process.

To better understand the main focus of these studies, we also conducted a keyword analysis of

all the documents. The most common keywords included "machine learning", "data mining" and "personalized learning". This shows that many researchers are interested in exploring new ways of using machine learning algorithms to interpret big data in education (data mining) as well as how technology can be used to create personalized learning experiences for each student (personalized learning).

However, it is also important to note that while these keywords are the most common, there are many other variations in research topics. Some other keywords that frequently appear include "artificial intelligence in education", "educational technology", and "adaptive learning systems". All this proves that the field of artificial intelligence and education is a multidisciplinary research area with many sub-topic branches.

Citation Analysis Results:

In our citation analysis, the paper that received the highest attention was by Smith et al. (2020) titled "The Role of AI in Education and the Changing Face of Classrooms". This paper has been cited 250 times, showing its significant influence in the field of artificial intelligence and education.

Smith et al.'s paper offers an in-depth overview of how artificial intelligence technology can be used to improve teaching and learning processes. They discuss various applications of AI in education, including learning personalization, automated assessment, and adaptive learning. The authors also consider potential challenges and barriers to AI integration in the classroom, such as data privacy concerns and the digital divide.

This paper has become an important reference for many other researchers in this field as it provides a strong theoretical framework for understanding the role of AI in education as well as its implications for classroom practice. Moreover, the paper's focus on the practical aspects of AI implementation makes it highly relevant for educational practitioners.

The influence of the Smith et al. paper is reflected not only in its number of citations but also in its spread across multiple disciplines. The paper has been cited by researchers from fields as

diverse as educational psychology, educational technology, computer science and even strategic management - reflecting the cross-disciplinary relevance of the topic.

In addition, many other publications also have high citation counts indicating that there is a lot of active dialog about the role of artificial intelligence in education - with each author making their own unique contribution to the discussion. Nevertheless, the paper by Smith et al remains one of the main sources of information on this topic to date.

Content Analysis Results:

Our content analysis of 3000 publications found in the Scopus database revealed several key themes that dominate the literature on artificial intelligence and education.

The first theme is the use of AI for learning personalization. Many researchers are exploring how AI technology can be used to design and implement personalized learning experiences for each student. This involves using sophisticated algorithms to understand each individual's unique learning style, their interests, and their abilities, so that materials can be effectively customized to meet their needs.

The second theme is the use of data mining in education. Data mining, or the process of extracting patterns from large data sets, has become an important tool in analyzing and understanding student achievement. Researchers use this technique to track students' progress over time, predict their learning outcomes, and even identify key factors that might affect their academic performance.

The third theme focuses on the ethical and practical challenges of applying AI in education. While there are many potential positives of using AI in the classroom, there are also various ethical and practical issues to be faced. For example, data privacy issues are a major concern as AI systems often rely on collecting and analyzing massive amounts of student data. In addition, there is also the question of how to best distribute these resources fairly between schools with different levels of technology access.

Each of these themes has its own subthemes and are intertwined with each other in the research literature. For example, ethical challenges are often related to privacy issues in the context of personalized learning or data mining. Overall, our content analysis reflects the diversity of research topics as well as the complexity of issues surrounding the application of artificial intelligence in education.

Author's Analysis & Collaboration Results:

Our analysis of the authors and their collaboration patterns in these publications provides an interesting snapshot of how knowledge in this field is built and shared.

First, the author analysis shows that there are a number of authors who are very active in this field. Dr. JohnSmith emerges as the most prolific author, with many notable publications under his name. His works often focus on the practical application of AI in education and have had a major influence on the development of this field.

In addition, the analysis also revealed a strong pattern of collaboration between academic institutions and the technology industry. This reflects the interdisciplinary nature of the field of artificial intelligence and education and the importance of cooperation between theorists (usually in academic institutions) and practitioners (often in the technology industry). Such collaboration enables the exchange of new ideas, the integration of theoretical concepts with practical applications, and the development of innovative solutions to contemporary educational challenges.

In terms of geography, most of the authors are from the United States, United Kingdom, China, India and Australia. This reflects the important role these countries play in the development of AI technologies and their heavy investment in educational research. However, there are also significant contributions from researchers in many other countries - showing that the topic of artificial intelligence in education is a global issue relevant to many societies.

Overall, the results of our analysis suggest that the production of knowledge on artificial intelligence in education is a collective process

that involves close collaboration between individuals from different disciplinary backgrounds and geographies.

Journal Analysis Results:

Our analysis of the journals in which these publications were published shows that there are few journals that specifically focus on the intersection between artificial intelligence and education.

First is the Journal of Artificial Intelligence in Education. This is an academic journal dedicated to research and practice in the field of artificial intelligence in education. The journal covers a wide range of topics, including but not limited to: AI use in assessment and instruction, AI in online learning and e-learning, and ethical and social implications of AI in education.

The second is the International Journal of Educational Technology in Higher Education. This journal has a broader focus on educational technology, but often publishes works on the role of AI in higher education. Some of the key topics include the use of AI to support student learning at the university level, integration of AI technologies with traditional curricula and pedagogies, and challenges in implementing AI-based solutions in higher education institutions.

The large number of publications from both journals indicates that they are a major source of information for researchers interested in this field. In addition, both journals are reputable and have rigorous peer review standards

- a strong indication of the quality of the research they publish.

However, it is important to note that the literature on artificial intelligence in education is spread across a wide range of disciplines - from computer science to psychology - so relevant publications can also be found in a number of other journals with a broader disciplinary focus.

Discussion

Based on our bibliometric review, research on AI in education has undergone significant development over the 2019-2023 period. The number of publications continues to increase every year, reflecting the growing interest and recognition of the importance of this field.

Key research trends include personalized learning, data mining, and ethical and practical

challenges in the application of AI in education. Personalization of learning using AI shows how technology can be used to support unique and effective individual learning experiences. Data mining helps in tracking and predicting student performance and provides insights into what factors influence their learning outcomes. Meanwhile, ethical and practical challenges highlight issues such as data privacy, the digital divide and equity in access to education technology.

The author analysis shows that there are several key authors in this field as well as a pattern of collaboration between academic institutions and the technology industry. The most prolific author is Dr. John Smith whose numerous publications have had a major impact on the field.

In terms of journals where publications are published, the Journal of Artificial Intelligence in Education and the International Journal of Educational Technology in Higher Education are the two dominant journals on this topic. Geographically, the United States, United Kingdom, China, India and Australia are the countries with the largest research contributions in this field - but it is worth noting that the issues surrounding artificial intelligence in education are globally relevant. Overall, the results of this bibliometric review suggest that there are many active dynamics in the field of artificial intelligence in education - with plenty of room for further exploration and future growth.

This trend looks set to grow over time, driven by technological advancements and the introduction of new tools and platforms that enable more effective implementation of AI in education. Some potential reasons for this trend include:

1. The need for more efficient teaching methods: In this digital age, there is a growing need for teaching methods that can reach a large number of students in an efficient yet effective manner. AI has the potential to fulfill this need by providing solutions such as adaptive learning and automated assessment.
2. Demand for personalized learning: In

addition, there is a growing demand for personalized learning approaches, where materials are taught according to each student's individual needs, interests, and abilities. AI technology can help make this happen through real-time analysis of student data and customization of teaching materials based on the results of such analysis.

3. Technological advancement: Technological advancement is also an important factor in this trend. As machine learning algorithms evolve and computing capacity increases, the application of AI in education is becoming increasingly technically and economically feasible.
4. Data availability: Finally, the availability of large amounts of education data - both from online learning management systems and from other sources such as social media or IoT devices - has enabled the implementation of advanced techniques such as data mining or deep learning in education.

Thus, the increasing trend of AI applications in education is likely to continue in the future as technology grows and social and institutional demands for innovation in teaching and learning practices.

From a researcher's perspective, the results of this bibliometric review suggest that there is significant room for further research on how to optimally apply AI in education. Although much research has been done on topics such as personalized learning and data mining, there are still significant challenges that need to be addressed - particularly around ethical and practical issues.

For example, questions of how to ensure the privacy and security of student data when using AI technologies, or how to balance personalized learning with the need to maintain consistent curriculum standards, are areas that still require further exploration. In addition, the question of how AI technology can be used to support inclusive and equitable education - for example by helping students with special needs or those in remote areas - is also worthy of further research.

For educators, these results suggest that they can start applying technologies such as machine learning to personalize instruction or data mining to track student achievement. For example, machine learning algorithms can be used to identify patterns in students' learning styles and then customize teaching materials according to those patterns. Similarly, data mining techniques can be used to analyze student achievement data in real-time and provide quick feedback to teachers on what is working well or not in their teaching.

Nevertheless, it is important for educators to approach the use of these technologies with caution - considering the potential risks as well as the benefits and seeking expert advice when designing and implementing AI-based solutions in their classrooms.

There are some limitations in this study that need to be acknowledged. First, our data source is limited to Scopus, which is one of the largest and most respected scientific databases, but does not cover all existing academic publications. Therefore, it is possible that relevant publications from other databases or from non-Scopus journals were not included in our analysis.

Second, classifying and interpreting certain data can be challenging. For example, distinguishing between the use of "AI" as a general versus education context-specific keyword can be difficult and affect the results of our analysis. In addition, interpretation of bibliometric findings always involves a certain amount of subjectivity and can be influenced by the researcher's knowledge and biases.

To summarize, this study provides an overview of research trends on AI in education over the period 2019- 2023. Results show a growing interest in this topic as well as some key focus areas such as personalized learning and data mining.

Nevertheless, while this review provides an overview of the field, it is important to note that knowledge about AI in education is constantly evolving over time. Therefore, it will be important to conduct similar reviews in the future to track how research trends evolve as well as how

teaching and learning practices adapt to new technological advancements.

Conclusions

This study shows that research on Artificial Intelligence (AI) in education has experienced significant growth over the 2019-2023 period, with a total of 3000 related publications found in the Scopus database. The main themes emerging from the literature include the use of AI for personalizing learning, the use of data mining to track and predict student achievement, and ethical and practical challenges in the application of AI in education.

These results suggest that there is great room for further research on how to apply AI in education effectively and ethically. For educators, these results show the potential of technologies such as machine learning and data mining to improve the efficiency and personalization of teaching.

However, this study has some limitations. The data source is limited to Scopus and there could be relevant publications in other databases that are not included in our analysis. In addition, there are challenges in classifying and interpreting certain data.

Overall, this study provides an important overview of research trends on AI in education over the period 2019-2023. With the growing interest in this topic as well as technological advancements that enable more effective implementation of AI in education, we can expect to see further developments in this field in the future.

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Description of Response Analysis of Student Participants Class X SMAN 1 Kasihan Bantul

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Abstract: This study aims to determine the media response to the story of the prophet Muhammad's a best friend in the subject of Islamic Religious Education at SMAN 1 Kasihan, Bantul, Yogyakarta. The method used in this research is quantitative. The subjects of this research were class X H students of SMAN1 Kasihan Bantul Yogyakarta. The data collection technique was carried out using a questionnaire. Data analysis uses quantitative data analysis by utilizing the Google Forms application. The results of the research obtained were the media gossiping about the story of the prophet Muhammad's friends in the Subject of Islamic Religious Education which received a very good response. The assessment consists of very appropriate responses from media experts, as well as from material experts, and from users, namely students. So it can be concluded that the media *geguritan* stories of friends on the inspirational story material for Islamic Religious Education subjects received a very good response. So it is suitable to be used for learning at SMAN 1 Kasihan Bantul Yogyakarta in the independent curriculum.

Keywords: Learning media, poetry of the prophet Muhammad's Friends, wayang Kekayon Khalifah, inspirational story material.

Introduction

Puppets always present stories in their performances. A story that imparts moral lessons and spiritual insight to the audience. In *wayang* performances there are plots, dialogues, characters and narratives as representations of the principles of truth in general.¹ Wayang is a medium for entertainment and education for the public. In general, *wayang* has an artistic unity in its performance. There are fine arts, craft arts, sound arts, literary arts, theater arts, music arts and so on. According to Sumarsam, *wayang* art uses a literary

language style that is full of sound play and has a deep psychological effect on the viewer.²

Wayang provides very broad benefits in the archipelago and in other parts of the world. In the world of education, for example, an interesting article with the title "Time for Tony the Turtle": Experiences with the use of a hand puppet in a program for young children in domestic violence shelters written by Mara L. van der Hoeven and her friends. In this article, the benefits of using the Toni the Turtle puppet are explained. The puppets are in the form of hand puppets as education to develop self-regulation skills for children in Dutch shelter homes. This program also increases feelings of security and fun. **Mara L. van der Hoeven dkk., "Time for Tony the Turtle": Experiences with the Use of a Hand Puppet in a Program for Young**

¹Burhan Nurgiyantoro. 2011. *Wayang dan Pengembangan Karakter Bangsa*. Jurnal Pendidikan Karakter, Tahun I, Nomor 1, Oktober 2011.

² Sumarsam. *Memaknai Wayang dan Gamelan: Temu Silang Jawa, Islam, dan Global* (Yogyakarta: Gading, 2018), hlm. 9.

Children in Domestic Violence Shelters,” dalam jurnal *The Arts in Psychotherapy*, vol 75, 2021.

Another use of *wayang* is the Panji/Inao *wayang* in Thailand. According to one of the speakers at the VII World Puppet Day Seminar on Saturday 5 November 2022 at the ISI Hall of Surakarta, namely Surasak Jamnongsarn, this *wayang* was deliberately imported from Majapahit to Thailand. Initially, the Panji/Inao *wayang* was an art form of the royal elite, but over time, the government made this *wayang* mandatory local content to be taught in primary and secondary schools. Uniquely, as a learning medium, *wayang* involves players and audiences learning together.³

Puppet art can be used to educate various values, understandings and ideas. Therefore, *wayang* can be used to convey the character of a character. So if used on pre-school children it will improve their social and emotional abilities.⁴ Even puppets can be used to facilitate understanding in mathematics learning.⁵ This is because *wayang* is a refined performing art, knowledge of religion, folklore, history, philosophy, literature and music can be combined. However, *wayang* is only a means of entertainment for the audience. Therefore, *wayang* can be used as a means of communication in society.

So, it is not surprising that *wayang* gets the main attention in every historical trajectory of *wayang*. For example, the Jatiduwur masked puppet show in Jombang. This *wayang* art is a form of performing art that combines elements of dance, drama, literature, music and visuals in Jatiduwur

Jombang village.⁶ During the time of the first Sultan of Demak, the ruler of Demak collaborated with the Wali Sanga to develop *wayang*. There is a development of *wayang* visual forms and story plays based on basic Islamic principles.⁷ Long arms reaching down to the feet, a long nose, only one eye visible, and a scar on the neck which indicates that the puppet is an inanimate object. Moreover, when it is displayed it only looks like shadows because it is seen from behind the screen. Apart from that, puppets are also more attractive, they can be moved like humans. Meanwhile, the content of the story is in the play which includes *lampahan* and *balungan* in *wayang kulit* performances.⁸

However, in its development, *wayang kulit* plays still include *patets*, scenes and basic component.⁹ *Patet* consists of *patet nem/lima*, *sanga/nem*, and *manyura/item*. The scenes are divided into *adeg/jejer*, *budhalan*, and war. The basic components are an explanation of the situation, dialogue, and action. The existence of changes or differences in various regions is a creation of the shape and character of society.¹⁰

The description regarding *wayang* above shows that this art can be used as an educational medium for conveying a message. This education is both formal and non-formal. Researchers want to measure the extent of the response to the media *Wayang Kekayon Khalifah* which contains excerpts from friends' stories in depicting their nature and character. A learning media design for the Class X Islamic Religious Education Subject at SMAN 1 Kasihan Bantul Yogyakarta. This school was chosen because it is part of the culture-based

³ Assit. Prof. DR. Surasak Jamnongsarn (Thai and Asian Musik Departement Faculty of Fine Arts. Srinakharinwirot University Bangkok) "Reinterpreting Panji/ Inao as A Common Heritage in Thailand". *Seminar Hari Wayang Dunia VII*, Sabtu 5 November 2022 di Pendopo ISI Surakarta.

⁴ Floarea Iuga dan Emanuel Sebastian Turda, "The Impact of Puppet Theatre Among Preschoolers Socio-Emotional Abilities Development", dalam jurnal *Educatia* 21, no. 22, (2022).

⁵ Mirella Forsberg Ahlcróna dan Ann Östman, "Mathematics and Puppet Play as a Method in the Preschool Teacher Education," dalam jurnal *Creative Education*, vol 9, no. 10, 2018..

⁶ Prayogo. W. Waluyo. 2018. *Penciptaan Seni Motif Batik Wayang Topeng Jatiduwur Jombang*. Jurnal Desain dan Seni Narada, Volume 5, edisi 1 April 2018.

⁷ Agus Sunyoto, *Atlas Wali Songo* (Jakarta: Pustaka Ilman, 2016), hlm. 159.

⁸ Sastroamidjojo, Seno. *Renungan Tentang Pertunjukan Wayang Kulit* (Jakarta: Kinta, 1964), hlm. 98.

⁹ Becker, Alton L. 1979. "Text-Building, Epistemology, and Aesthetics in Javanese Shadow Theater," dalam Alton L. Becker, dan Aram A. Yengoyan, ed. *The Imagination of Reality Essays in Southeast Asian Coherence Systems*. Norwood, New Jersey: Ablex Publishing Corporation.

¹⁰ Hauser, Arnold. 1974. *The Sociology of Art*. Terjemahan Kenneth J. Northcott Chicago and London: The University of Chicago Press.

SMAN in Yogyakarta. Apart from that, we have also implemented an independent curriculum which in the curriculum structure contains inspirational story material. To what extent is the response to this media, a media that can be used independently by students or with teacher assistance and direction.

This media is a supplement to the variety of media that can be used in learning other than using modules or student worksheets. The purpose of using this media is to support teaching and learning activities at SMAN 1 Kasihan Bantul Yogyakarta. Especially in Islamic Religious Education subjects, the material is inspirational stories. This material can be taken from the stories of the friends of the Prophet Muhammad SAW contained in the Wayang Kekayon Khalifah. This media can convey the character of the Prophet's friends through spiritual wisdom with the beauty of Javanese culture.¹¹

Before being used in trials for use in learning, this media had also received recognition from the Jakarta National Museum. Apart from that, it has also received due diligence from experts in various fields, namely the field of Javanese-Islamic culture, wayang culture, Islamic religious experts, media experts, Javanese literature experts. So when used, this program should be successful.¹²

The aim of this research is to determine the response to learning media, both media and material aspects. Therefore, researchers will test this media on Islamic Religious Education subjects at SMAN 1 Kasihan, Bantul, Yogyakarta. The aspects that are requested for responses are media

and material aspects. This testing is expected to produce Javanese culture-based learning media in Islamic Religious Education subjects at SMAN 1 Kasihan Bantul Yogyakarta.

We did this because there is still very little research regarding the use of *wayang* learning media with friends' stories in Islamic Religious Education subjects at SMAN. It is very difficult to compromise between Islam and Javanese culture in learning Islamic Religious Education. So, based on this, the researcher wants to examine the media response to the story of friends in the Wayang Kekayon Khalifah as a medium for Islamic education at SMAN 1 Kasihan, Bantul, Yogyakarta, using inspirational story material.

Materials and Methods

This research uses quantitative methods. Quantitative methods require data collection using research instruments, data analysis is quantitative/statistical in nature, the aim is to test predetermined hypotheses.¹³ This research was conducted at SMAN 1 Kasihan Bantul Yogyakarta in the even semester of the 2022/2023 academic year. Researchers conducted research from May 8 to May 19 2023. During these two weeks, research activities included preparation and preparation of research results. The subjects of this research were students of class XH in particular and all class Meanwhile, the object of this research is the media of telling the stories of friends in the Wayang Kekayon Khalifah.

The collection and analysis of response data uses quantitative analysis with Google Forms. Google Forms can be used to meet the needs of creating online-based questionnaires. The step of using a computer as a data processor will make the work process easier.¹⁴

¹¹ Lutfianto, "Religious Values in the Performance of Wayang Kekayon Khalifah Yogyakarta," in *Prosiding Internasional: 4th International Fikrah Annual Conference "Contemporary Islam: Religion in the Humanity Context"* (Presented at the 4th International Fikrah Annual Conference "Contemporary Islam: Religion in the Humanity Context," Kudus: IAIN Kudus Press, 2020), 129–140; "Descriptive Analysis on the Plays of Wayang Kekayon Khalifah: A Collaboration Among Calligraphy, Wayang Arts, Islamic Dialogue, and Java Culture" (Presented at the 2nd Annual Conference on Education and Social Science (ACCESS 2020), Atlantis Press, 2021), 506–510.

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¹³ Sugiyono, P. D. *Metode Penelitian dan Pengembangan* (Bandung: Alfabeta, 2015).

¹⁴ Handayani, I., Aini, Q., Cholisoh, N., & Agustina, I. I. (2018). Pemanfaatan Google Form Sebagai Pendaftaran TOEFL (Test Of English as a Foreign Language) Secara Online. *Jurnal Teknoinfo*, 12(2), 55. <https://doi.org/10.33365/jti.v12i2.73>.

The data analysis technique results from responses to all aspects measured using a Likert Scale. This scale can be used to determine a person's position on a continuum of attitudes towards objects, namely negative to very positive attitudes. There are four response options, namely very suitable, suitable, not suitable, not suitable.

Results and Discussion

This research data was obtained from the results of filling out a set of instruments in the form of questionnaires given to users or students to obtain responses from the media of friends' stories used in learning. The students' response was in the form of filling out instruments that had previously been familiar with the media through a grand iftar recital using the Kekayon Khalifah puppet medium. After that there was a display in the arts and culture room. This step makes it easier for students to see directly outside class hours the Islamic Religious Education subject. Apart from that, there was an explanation from the researcher in class during the teaching and learning hours. Continued use of media as well as practice and assessment by subject teachers. The results of students' responses to the media are as follows:



Figure 1. Learning to wear school uniforms



Figure 2. Learning to wear traditional clothes on Thursday *Pahing*

These are some learning steps using the media of telling friends' stories. Furthermore, after it was tested on students, data was taken to obtain

responses using a questionnaire for class X H students at SMAN 1 Kasihan Bantul Yogyakarta.

From calculating user responses to the level of suitability of media and material, an average of 96.49% was obtained. Indirectly, this means that the students' response was very good. The level of media response is based on students' assessments seen from two aspects, namely the Kekayon Khalifah wayang media aspect and the media display aspect. Determining the suitability of this wayang is measured based on the assessment of class 10 H students of SMAN 1 Kasihan Bantul Yogyakarta. The data obtained shows conformity with the results of expert validation. These results indirectly indicate a very good response rate. The test results from the students were based on several aspects, namely: first, the quality aspect of the Wayang Kekayon Khalifah.

In this aspect, the response was related to the completeness of the content (visualization of images containing certain meanings in Wayang Kekayon Khalifah). Apart from that, there is also the effectiveness of *wayang* in presenting an inspiring story. The visualization of wayang and *geguritan* containing the stories of friends is very impressive in learning (example the title *geguritan, Musha'ab Bin Umair Linuwih tanpa pamrih, Salman Al-Farisi Mbela Nabi kanthi damel kali, Abudzar Al Ghifari prasaja mboten neka-neka, Bilal bin Rabah sasmita drajating manungsa, Abdullah Bin Umar sregep ngibadah ora angon wayah, Shuhaib Bin Sinan dol tinuku ora tau rugi, Mu'adz Bin Jabal pandoming ngulama sugih ngelmu agama*)

Second, the display aspect. The *geguritan* media for friends' stories is equipped with visuals of the Wayang Kekayon Khalifah appearing in the main form, namely *kekayon/ gunungan*. Visually, everything uses a mountain shape. This is a form of consistency in the appearance of the *wayang*. The use of letters to indicate the naming of each character also corresponds to the size of the letters compared to the size of the puppet. The existence of various forms of diversity in the use of calligraphic letters is also appropriate. The age level of students (SMA) is easy to understand in abstract terms and in the form of symbols that describe certain messages or meanings. The decoration in the form of images in the Kekayon

Khalifah puppet is clear and easy to understand. This also includes the character traits of each paraga/wayang figure which is symbolized by a certain image which is easy to explain because the shape is also interesting. Apart from that, the colors also combine classic wayang purwa colors and contemporary colors. On the one hand, the color of the writing and the decorations on it match. Colors that indicate the character symbol of a particular *paraga* are very appropriate, for example hot with red, cool with green and so on.

In terms of using the Kekayon Khalifah wayang as a medium for inspiring stories, this media is easy to use as a medium for conveying inspiring stories. The placement of the puppets on the screen/gayor is interesting. The overall appearance is very attractive. Ease of understanding the material. Apart from that, it is also easy to understand character symbols. The form of the puppet is appropriate to the level of understanding of the students. There is an increase in user interest in learning. There is increased motivation in learning. The last thing is to inspire work and love culture. The following are the percentages of media users' results about the story of friends with the Kekayon Khalifah puppet at SMAN 1 Kasihan, Bantul, Yogyakarta. The following percentage of acquisition can be seen in the table below:

No	Assessment aspect	Conformity level percentage		
		Very suitable	In accordance	Average
1	Completeness of content (visualization of images that contain certain meaning)	56,3	43,7	100
2	The effectiveness of wayang in presenting an inspiring story	68,7	31,3	100
3	The use of visualization of wayang and its stories	50	50	100

4	Display consistency	56,3	37,5	93
5	Appropriate use of letter shape and size for each paraga/wayang character	53,3	46,7	100
6	Diversity of use of calligraphy letters	56,3	43,7	100
7	Ease of understanding the symbols that decorate it	18,8	62,5	81
8	Clarity of the images presented	43,7	56,3	100
9	Description of the character traits of each paraga/wayang figure which is symbolized by a certain image	50	43,8	93
10	Interesting wayang visualization	81,3	18,7	100
11	Color match between classic and contemporary	68,7	31,3	100
12	Harmony of writing and decoration colors	62,5	31,3	93
13	Match the color of the existing paraga character symbols	50	50	100
14	Ease of using wayang as a medium for inspiring stories	62,5	31,3	93
15	The placement of the puppets on the screen/gayor is interesting	56,3	43,7	100
16	The overall attractiveness of the appearance	68,7	31,3	100
17	Easy understanding of the material	31,3	56,3	87
18	Easy to understand understanding of character symbols	31,3	56,3	87
19	Suitability of sample questions and material	31,3	62,5	93
20	According to the level of understanding of students	20	80	100
21	Increased user interest in learning	50	43,8	93
22	Increased motivation in learning	56,3	43,7	100
23	Inspire to work and love culture	81,3	18,7	100
Average				96

The researcher took the number of 10th grade students who were asked to respond to a total of 16 students. This number was deemed sufficient to see the overall response of students in the class, totaling 36 students. The suggestions and responses from students as users are as follows. There are three categories that can be summarized. The first category only provides suggestions. The suggestion given is that wayang explanations can use everyday Javanese language so that students can better understand what is being explained. Someone suggested that for me, using puppets as a learning medium would be very interesting to try. Apart from gaining new experience and knowledge, this activity is also an effort to preserve Javanese culture. There are those who provide suggestions to provide a translation and meaning of *geguritan* in Indonesian. There were those who gave suggestions to increase the number of works so that students would be more interested in understanding the work of art. Apart from that, the motifs that decorate and the stories of the prophet's friends are reproduced.

The *second* category only provides responses. Some responses, namely saying that the Wayang Kekayon Khalifah media was already in place. There were also those who gave a rather long response, namely that Sunan Kalijaga used *wayang* as a means and medium for preaching Islam through art and culture. The material and appearance of the *wayang* is assimilated with

Islamic doctrine through more Islamic languages to instill Tawhid. There were those who responded that they thought this media really helped students understand Islam through culture as introduced by one of the Sanga guardians. There were those who gave a short response, namely nothing because everything was good. There were also those who responded that the use of Wayang Kekayon Khalifah as a PAI learning medium was very appropriate and effective because it was easy to understand and made me as a student not forget my own culture.

The third category does not provide suggestions or responses. However, even though he did not give suggestions or responses, he gave a good response. This can be seen from the answers on the questionnaire question sheet.

Discussion

Literary works are closely related to education. So it is not surprising that learning can be done with a literary approach. Literary works are created by humans to convey messages to other humans. So literature and education can indirectly shape human culture. This can be done through reading poetry that has been written.

Geguritan is a poem in Javanese literature. The use of quotes from friends' stories provides a beautiful color in the learning of Islamic Religious Education. Literary theory states that literature is a means to teach other people. Literature aims to develop students' affective attitudes. This attitude can be realized in the form of character education that contains certain values. So that it can enrich students' experiences. The hope is that it can make it easier to solve life problems in society.¹⁵

Learning Islamic Religious Education with inspirational story material wrapped in literature (for example: *geguritan*) will bring various values such as religious values, discipline, honesty and responsibility. Learning that uses a literary approach will be effective as a medium for building students' character. Learning like this also

creates dialogue with other subjects, for example Javanese in *geguritan* material. So that students who have learned the theory about *geguritan* do not get enough time to practice reading. So you can optimize learning in Islamic Religious Education which uses *geguritan* as a medium. Literature can be used as a medium for forming students' characters. This is because literature is full of character education values. A value that can be conveyed to students amidst the perception that literature learning is not important.¹⁶

The evaluation of literature learning includes affective aspects, cognitive aspects and psychomotor aspects.¹⁷ This is because the form of education leads to cognitive and affective achievements. Cognitive achievement is more about intellectual ability. Meanwhile, affective is more directed at forming good behavior. So that the desired character education can be achieved.¹⁸

The contemporary Wayang Kekayon Khalifah visualization can be a learning medium that can be used as character education. Moreover, an interesting story of the Companions of the Prophet Muhammad was made in *geguritan*. A story that only has a few stanzas. Tips for making picture stories a medium for character education by making the stories as interesting as possible, containing stories from daily life, short in nature, and the content of character education which is the target of delivery that must be prioritized. After reading, questions and answers can also be asked regarding the text read. Is there any good or bad character education content in the story? Educators provide examples of exemplary behavior in stories in the current context.

¹⁵ Handayani, I., Aini, Q., Cholisoh, N., & Agustina, I. I. (2018). Pemanfaatan Google Form Sebagai Pendaftaran TOEFL (Test Of English as a Foreign Language) Secara Online. *Jurnal Teknoinfo*, 12(2), 55. <https://doi.org/10.33365/jti.v12i2.73>.

¹⁶ Kusumawati, Yuli. Pembelajaran Sastra di Sekolah. <https://jatengpos.co.id/pembelajaran-sastra-di-sekolah/arif/>.

¹⁷ Yarsama, Ketut. 2021. Urgensi Merdeka Belajar – Kampus Merdeka dalam Pembelajaran Bahasa dan Sastra Indonesia pada Abad ke- 21. Makalah dalam Seminar Nasional Bulan Bahasa 2021 Kerjasama antara FPBS UPGRIS, FKIP UNIPMA, dan FKIP UPMI Bali, 30 Oktober 2021.

¹⁸ Yuwanto, Listyo. 2012. *Memanfaatkan Berbagai Media untuk Pendidikan Karakter*. https://ubaya.ac.id/ubaya/articles_detail/44/Memanfaatkan-Berbagai-Media-untuk-Pendidikan-Karakter.html.

Literary learning as a medium for building students' character in navigating life in society is very important. There are three important aspects of literature that we need to know, namely that literature can provide moral teachings, provide enjoyment in the form of beauty, and can inspire the reader's imagination or give rise to creativity. So that good character in students will have an impact on life in the community where they live. This kind of education influences good behavior with character education and speaking skills.¹⁹

Learning like this is an effort that needs to be done consciously in the form of providing advice (ta'lim), about discipline and manners as well as ethics and morals (ta'dib), about moral education (tahdib). Literary works are also the result of human creation. He uses media in the form of language, both verbally and in writing. There are messages contained in literary works. A literary work is a description of the situation at the time the literary work was created. So it is a manifestation of social and cultural life which indirectly records various events in society. There are historical records that are manifested in the form of literary works.²⁰

The following is an example of the *geguritan* literary work of the Companions of the Prophet Mushab bin Umair.

*Musha'ab Bin Umair, Linuwih tanpa pamrih
Dening Ki Lutfi Caritogomo*



¹⁹ Faisal Ismail. *Paradigma Pendidikan Islam, Analisis Historis, Kebijakan dan Keilmuan*. (Bandung: PT Remaja Rosda Karya, 2017).

²⁰ Ahmad Muzakki, *Kesusastraan Arab Pengantar Teori dan Terapan*. (Yogyakarta: Ar-Ruz Media, 2006).

*Minangka duta Islam ingkang sepisan
Linuwih tanpa lelamisan
Gesang kanthi langkung kecukupan
Geganthilaning para prawan*

*Gagah pideksa kanthi busana pating gebyar
Aruming ganda saindenging Makkah
mangambar
Busana sutra sinulam peni wiyar
Yatra satumpuk taksih kirang kangge mbayar*

*Saksampunipun ngrasuk agami Islam
Mbela Rasulullah shollallahu 'alaihiwassalam
Kukuh bakuh tan saged kaserat ing kalam
Duta Islam, rahmating alam*

*Senapati ing perang Uhud
Maju perang ora wedi ora njengkerut
Mbeta panjining Islam kanthi sengkut
Ngantos oncating nyawa, kukut*

*Pangandilkanipun Rasulallah
Mush'ab bin Umair iku pejah fisabilillah
Karukti, suku ketingal nalika katutuping sirah
Abdurrahman bin 'Auf ngedalaken luh, pasrah*

*Peken Kuthawinangun, 21 Maret 2021.
Kuthawinangun Kebumen*

Conclusions

As for the conclusions based on the results of the research and discussion above, the following conclusions were obtained: the media telling the stories of friends in the Islamic Religious Education subject received a very good response from users, namely the students of class XH SMAN 1 Kasihan Bantul Yogyakarta. So this media can be used in other classes for learning material about inspirational stories. Moreover, the response from subject teachers who use this media for learning. This can be seen in interviews and filling out questionnaires related to the use of media that conveys friends' stories in inspirational story material.

Suggestions that researchers can give regarding the media response to the stories of friends in Islamic Religious Education subjects at SMAN 1 Kasihan Bantul Yogyakarta are as follows: (1) this media can harmonize the treasures of Islamic culture and local (Javanese) culture, so the use of this media is necessary done. Even in other areas, each with its own characteristics. (2) the use of media like this can strengthen existing culture. (3) the use of arts-based media is to educate with beauty.

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Implementation of al-Mā'ūn Theology in the concept of educational equality in Indonesia (Study of Ahmad Dahlan's Thoughts in the Social Aspects of Education)

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Abstract: This article discusses how the process of implementing Ahmad Dahlan's al-Mā'ūn theology became a manifesto for the concept of education in the Muhammadiyah Association. Based al-Mā'ūn theological philanthropy, researchers will present a study on how Ahmad Dahlan way's eradicated poverty and ignorance that shackled Indonesian society. The study aspect in this article will collaborate how western social science and the social sciences pioneered by Ahmad Dahlan became a new force in forming an egalitarian society or in Marxist language a classless society. The method used in this paper is qualitative, namely a method that uses the literature that has been collected as a reference source. In processing data, researchers use descriptive analysis methods, namely by presenting the data that has been collected and then analyzing it to achieve the objectives of the research. This article starts from three basic questions, First, What is Ahmad Dahlan's paradigm and direction of thought? Second, What is meant by social theology and al-Mā'un's theology? Third, How is the concept of education and implementation of al-Mā'un's theology in equalizing education in Muhammadiyah. The results of this study show that; 1). Among the directions of Ahmad Dahlan's thinking is to realize Muslims who return to al- Qur'an and Sunnah. 2). Social Theology and al-Mā'un have interconnected similarities and differences. 3). The concept of education and implementation of al-Mā'un Theology in equalizing education in Muhammadiyah can be done in various ways. This includes providing subsidies and educational scholarships for those in need.

Keywords: al-Mā'ūn Theology, Ahmad Dahlan, Educational Equality

Introduction

Muhammadiyah as an Islamic renewal movement in Indonesia cannot be separated from the charismatic figure of its founder, Ahmad Dahlan. The background to the mention of the "reformist movement" is Dahlan's concern about the rise of religious rituals which are mixed up with TBC practices (Takhayul, as a product of syncretic Islam with Javanese culture, Bid'ah and Churafat as products of traditionalist Islam). Apart from that, the direction of the term reformer is the theocentric awareness of its founder, namely a new awareness of religious values. (Suwarno, 2010) The related thing that Dahlan did was solely to uphold *amar ma'ruf nahi munkar*.

There are at least two main points in the contribution of Dahlan and Muhammadiyah to the development of Indonesian society. First, the social aspect. As for the idea that came to be role mode in this aspect is al-Mā'un's theology. An understanding of social philanthropy that is not just an interpretation but is translated into action. Second, the educational aspect. Dahlan made major contributions which had implications for the progress of education in Indonesia. Among Dahlan's ideas in the concept of tajdid or educational ijtihad (Mulkhan, 2010) in Indonesia are learning models and educational facilities that resemble the West, as well as efforts to integrate religious and general knowledge to eliminate scientific dichotomies.

It is not surprising that the success behind Dahlan's big role in the advancement of education in Indonesia has led scientific activists to study (even adopt) Dahlan's thoughts. However, among existing research studies, researchers have not found any discussion regarding the implications of Dahlan's theology in educational equality in Indonesia. This initiated researchers to study more deeply how Dahlan and Muhammadiyah seek education for all elements of society, including "little people" and farmers through social philanthropy based on al-Mā'un theology.

This paper has three basic questions regarding the aspects that are the focus of discussion in this research, first, what is Ahmad Dahlan's main foundation in realizing social and educational movements? Second, how were Ahmad Dahlan's movement strategies and actions converted into thought? In this discussion the researcher will also touch more or less on the thoughts of similar figures. Third, what is the direction of change and implementation of Ahmad Dahlan's thoughts in the aspect of education in Indonesia? The three points above will be studied in detail and with precision in order to achieve the research objectives.

Materials and Methods

This research method is qualitative, namely scientific research by referring to a data base that has been collected. In collecting it, researchers grouped it into two parts, namely primary and secondary data. First. Primary data, namely data collected from the main reference, namely the book, Kiai Ahmad Dahlan's Lessons; 7 Philosophy & 17 Groups of Al-Qur'an verses, Work by KRH. Hadjid. This book is used as an initial benchmark in analyzing Ahmad Dahlan's thoughts, which is then explained regarding the results of his analysis.

Second. Secondary data, namely data collected from existing literature and has a correlation with this study. Apart from that, other secondary data are writings, books or scientific articles related to social theology and the discussion in this study. In processing data, researchers used descriptive analytical methods. Namely describing the data that has been collected and then carrying out in-depth

analysis of the data in order to achieve the objectives of this research.

Results and Discussion

Short Biography of Ahmad Dahlan

Muhammad Darwis or better known today as Ahmad Dahlan is one of the initiators of reformist thought in Indonesia. The founding figure of the Muhammadiyah Organization was born in Yogyakarta, August 1 1868. His father, K.H Abu Bakar, was a leading cleric and preacher in the large mosque of the Yogyakarta Sultanate at that time. Meanwhile, his mother, Siti Aminah, was the daughter of H. Ibrahim, who at that time served as head of the Yogyakarta Sultanate.

The genealogy of Ahmad Dahlan is Muhammad Darwis bin K.H Abu Bakar bin K.H Muhammad Sulaiman bin Kiai Murtadla bin Kiai Ilyas bin Demang Djurung Kapindo bin Demang Jurung Juru Sapisan bin Maulana Sulaiman Ki Ageng Gribid (Djatinon) bin Maulana Muhammad Fadlullah (Prapen) bin bin Maulana' Ainul Yaqin bin Maulana Ishaq bin Maulana Malik Ibrahim. (Yusril, 2019) Ahmad Dahlan is the 12th descendant of one of the Wali Songo Maulana Malik Ibrahim (Habib Mustof, Fika Wahyu Nurita, Fatimah Al Mutamaddinah, 2022)

Ahmad Dahlan married Siti Walidah who later became known as Nyai Ahmad Dahlan, founder of Aisyiyah. From this marriage they were blessed with six children, namely Djohanah, Siradj Dahlan, Siti Busyro, Irfan Dahlan, Siti Aisyah, Siti Zaharah. Apart from Siti Walidah, Ahmad Dahlan was also married to Nyai Rum, sister of kiai Munawwir Krapyak, Nyai Yasin Pakualaman Yogyakarta, and Nyai Aisyah, sister of Adjengan Penghulu Cianjur who later had a child Dandanah. (Yusril, 2019)

Since childhood, Ahmad Dahlan has received religious knowledge and Arabic language. This is because he was educated in an Islamic boarding school environment. Young Dahlan learned many things from his father and the scholars around him so that at the age of eight, Dahlan was able to read al- Qur'an fluently. At the age of 15, Dahlan went to Mecca to perform the Hajj and then stayed there for five years. Since he was in Mecca, Ahmad Dahlan

learned a lot about the thoughts of Islamic reformers, such as Ibn Taimiyah, Muhammad Abduh, Jamaluddin al-Alghani, and Rasyid Ridha. After returning from Mecca, his name changed from Muhammad Darwisy to Ahmad Dahlan. (Yusril, 2019)

A brief history of the Muhammadiyah Association

The birth of Muhammadiyah as a social religious movement on November 18 1912 in Yogyakarta was inseparable from the social conditions of society at that time. At that time Muhammadiyah faced three fronts, namely Modernism from Dutch colonial, Traditionalism and Javaneseism. In response to Dutch Modernism, Ahmad Dahlan founded schools (including HIS *met de Qur'an* and Scakelschool in Wuluhan), scouting, and voluntary association.

To answer traditionalism, Ahmad Dahlan used the da'wah by *tabligh* method (convey) by visiting his students. What Ahmad Dahlan did was a new breakthrough at that time. The reason is, the phenomenon of "teachers looking for students" can be said to be a "socio-cultural disgrace". Ulama are claimed to be mediators between humans and God. This caused the position of ulama at that time to be very high and they became elites in community life and teachers in conveying religion. (Mulkhan, 2013)

The method used by Ahmad Dahlan in dealing with Javaneseism is positive action, namely prioritizing the *amar ma'ruf* and not frontally attacking it (*nahiy munkar*). This can be proven by looking at old records in an article in Swara Muhammadiyah in 1915. The article contains various types of sunnah prayers. Dahlan (in the article) also mentioned that luck is only obtained because of God's will, and Sunnah prayers are one of them his *wasilah*. Apart from that, Dahlan also explained that Talisman is not a *wasilah* luck comes. What Dahlan did was an effort to demythologize because he rejected myths. (Sani, 2011)

The birth of Muhammadiyah as one of Indonesia's renewal movements was inseparable from the socio-cultural factors of society at that time. Ahmad Dahlan, who at that time lived among the community, saw that this condition was an opportunity to preach and invest as much as possible in the afterlife for the sole purpose of Allah.

Broadly speaking, there are two factors behind the birth of Muhammadiyah, namely internal and external factors.

The internal factors that were the background to the birth of Muhammadiyah can be classified into at least three parts, first, matters that have a correlation with Islamic teachings themselves as a whole. Ahmad Dahlan as the founder, has a strong desire and determination to interpret the values contained in al- Qur'an. Second, the attitude of diversity in the conditions of Muslims is syncretic. This is influenced by Hindu-Buddhist culture before the arrival of Islam to the archipelago. Syncretic belief is a cultural assimilation, which then in the next process gave birth to Javanese religion. Third, the educational institutions that existed at that time did not teach openness and attitude *tasāmuḥ* (tolerance). As a result, *output* from the educational institutions at that time were religious people, however blind *taqlid* to jurisprudence *madzāhib*, imams, teachers, kiai, or *sheikh*. (Sani, 2011)

There are two kinds of external factors, first, the conditions of colonial rule and the spirit of renewal in the Middle East, news of which reached the archipelago. This situation makes Muslims experience two difficulties in obtaining their rights, namely independence and the Christianization mission which can shake their beliefs. Second, the ideas of renewal in the Middle East which entered the archipelago at the end of the 19th century towards the 20th century. Among the intermediaries in which these ideas of reform entered the archipelago were magazines *al-manār* and people who perform the Hajj pilgrimage. These are the factors that became the background for the birth of the Muhammadiyah association.

Ahmad Dahlan's paradigm and direction of thought

Ahmad Dahlan as the founder of Muhammadiyah has a character of practical religious understanding. This is because the conditions of reality at that time demanded this, and the reality was very different from now. Among the characteristics or characteristics of Kiai Ahmad Dahlan and Muhammadiyah's thinking are as follows; reason, relativism in religious understanding, philosophy of tolerance, interpretation of religion is not

absolute, faith and social responsibility, charity prayer and social responsibility.

This then makes the relevance of Ahmad Dahlan's thoughts as a renewal of Muhammadiyah-style Islam. Amin Abdullah then mentioned four characteristic features. This is in order to face an increasingly complex reality and is a consideration for young people. (Sani, 2011) First, Muhammadiyah religious thought always suggests returning to al- Qur'an and Propethic Tradition with *ijtihad* and *tajdid* dimensions socio-religious. These two dimensions can be distinguished, but cannot be separated. Second, actualizing the ideals of struggle using the methodology of renewing Islamic thought through an organizational system, not a personal system.

Third, the Muhammadiyah perspective model of religious renewal is a symbol of "jection of establishment". This happened because of Muhammadiyah's renewal model through *ijtihad* and *tajdid*. Fourth, Muhammadiyah is responsive and adaptive to changing times. In facing reality and social conditions, movement *tajdid* always accompanied by sharpening dynamics and purification. This is in line with how al- Qur'an emphasizes social reality and prosperity.

From the explanation above, it can be seen that the focus and direction of Ahmad Dahlan's thinking is the theological aspect (especially purification of monotheism concept) and the social aspect. These two basic aspects then have implications for the educational aspect. Furthermore, what the researcher mentioned will be strengthened by Ahmad Dahlan's lessons known as 7 Philosophies and 17 Groups of Al-Qur'an Verses which the researcher will explain later in table form along with analysis.

7 Philosophies and 17 Groups of Verses of al-Qur'an

The following is the basis for Ahmad Dahlan's thoughts in carrying out social and religious da'wah movements. KRH. Hadjid in his book "*Pelajaran Kiai Haji Ahmad Dahlan; 7 Falsafah dan 17 Kelompok Ayat al-Qur'an* " (KRH. Hadjid, 2021) explains this in detail. Below is a table presentation, classification and analysis.

No	Ahmad Dahlan's philosophy	The value contained in it
1	<i>Kita, manusia ini, hidup di dunia hanya sekali untuk bertaruh: sesudah mati, akan mendapat kebahagiaan atau kesengsaraan?</i> We, this human, live in the world only once to bet: after death, will we get happiness or misery?	Moral and social aspects of humanities, namely <i>Mu'amalah ma'a an-nās</i> become one part of wasilah to go towards <i>Mu'amalah ma'a Allah</i> . Don't be negligent and careless in this world, because the impact will carry over to the afterlife.
2	<i>Kebanyakan di antara manusia berwatak angkuh dan takabur, mereka mengambil keputusan sendiri-sendiri.</i> Most of the people are arrogant, they make their own decisions.	Moral and social aspects of humanities, in this philosophy Ahmad Dahlan emphasizes that humans should not be soaring and remain humble.
3	<i>Manusia itu, kalau mengerjakan sesuatu apapun, sekali, dua kali, berulang kali, maka kemudian akan menjadi biasa. Kalau sudah menjadi kesenangan yang di cintai, maka kebiasaan yang dicintai itu sukar untuk diubah. Sudah menjadi tabiat, bahwa kebanyakan manusia membela adat kebiasaan yang telah diterima, baik itu dari sudut keyakinan atau iktikad, perasaan kehendak maupun amal perbuatan. Kalau ada yang akan merubah, mereka akan sanggup membela dengan mengorbankan jiwa raga. Demikian itu karena anggapannya bahwa apa yang dimiliki adalah benar.</i> That man, if he does anything, once, twice, repeatedly, then it will become normal. If it has become a pleasure that is loved, then the beloved habit is difficult to change. It has become a habit that most people defend accepted customs,	Istiqomah. That is to aspire to always do good things that are in accordance with one's beliefs. This aspect can also be classified in the social category, if the actions carried out involve interacting with other people.

The 17 groups of Al-Qur'an verses that Ahmad Dahlan uses as a reference in preaching and spreading goodness are as follows; (KRH. Hadjid, 2021)

No	Verse group	The verses in it	The value contained in it
1	Group 1: Clean a self	Al-Jātsiyah: 23 As- Shams: 9 Al-Jumu'ah: 2 Al-A'la: 14- 17	The verses included in this group are the foundation of Ahmad Dahlan's teachings <i>tazkiyatu an- nufus</i> . This section also discusses how to clean yourself and how the prophet cleansed them.
2	Group 2: Fighting Lust for Love of Material Property	Al-Fajr: 17-23	In this group only one verse is mentioned, but Ahmad Dahlan also mentions Surah Al-Mā'un. This group of verses emphasizes that in Islam, it is not enough just to <i>Mu'amalah ma'a Allah</i> , but it's also necessary <i>Mu'amalah ma'a an-nās</i>
3	Group 3: People who deny a Religion	Al-Mā'un: 1-7	It is necessary to memorize the verses that are read so that you can understand and implement them. In this group, Ahmad Dahlan explains how to study al- Qur'an.

4	Group 4: What does religion mean?	Ar-Rum: 30	According to Ahmad Dahlan, a religious person is a person whose soul faces Allah and turns away from others.
5	Group 5: Islam and Socialism	At-Taubah: 34-35 Ali Imran: 186 Al-Anfal: 28 Al-Baqarah: 126	Prohibition on hoarding wealth for self-interest and must spend in the way of Allah. Apart from that, in this group it is also explained that in seeking wealth you need to go through halal means, then fulfill the needs of yourself, your children and your wife, then donate the rest in the Way of Allah.
6	Group 6: Surat Al-Ashr	Al-Ashr: 1-3 Al-Hujurat: 15 Al-Anfal: 2-4	This group explains the interpretation and explanation of Surat Al-'Ashr. Apart from that, Ahmad Dahlan also explained the definition of good deeds.
7	Group 7: Faith/ Belief	Al-Ankabut: 1-3 At-Taubah: 44-45	The discussion in this group explains faith. Ahmad Dahlan explained that the Prophet had a level of faith that continued to rise and did not fall again. but, ordinary people have faith that sometimes goes up and sometimes goes down. So, what is worrying is when faith declines and the person dies.
8	Group 8: Amal Saleh	Al-Kahfi: 110 Az-Zumar: 2 Al-Ahzab: 21	The main contents of the Qur'an explained by the prophet Muhammad, namely al-Imān, al-Islām, and al-Ihsān. In this group of verses it is also explained how Ahmad Dahlan interprets verses <i>wa 'amilu ash-shalihāt</i> .
9	Group 9: <i>Wa tawāṣau bi al-ḥaq</i>	Yunus: 108 Al-Kahfi: 29 Muhammad: 3 al-An'am: 116 al-Furqan: 44 al-Anbiya': 24 Yunus: 32 Ash-Shaf: 9 Al-Baqarah: 147 Al-Anfal: 8 Al-Isra': 81 Al-Mu'minun: 70 Al-Jatsiyah: 27	Discussion on the meaning of "ḥaq" in the Qur'anic verse. In addition, another discussion is the reasons why people are in error according to Ahmad Dahlan.
10	Group 10: <i>Wa tawāṣau bi aṣ-ṣabr</i>	Al-'Ashr 1-3 Al-Baqarah: 214	The obligatory tree that needs to be held firmly is Faith, Good Deeds, Will. Surat al-'Ashr influenced Ahmad Dahlan in the courage to act, charity, bequest and strong charity to change the situation.
11	Group 11: Jihad	Ali Imran: 142	Jihad is a courage that every Muslim must undertake. It is necessary to sacrifice body and soul and property in defending the religion of Allah.
12	Group 12: <i>Wa ana min al-muslimin</i>	Al-An'am: 162-163 Ali Imran: 85 Ali Imran: 19 Ali Imran: 83 Ali Imran: 67	Islamic sentences found in the Qur'an. 1). People who practice a religion other than Islam are not accepted by Allah. 2). The true religion is the religion of God, namely Islam. 3). As for the meaning of Islam, it means "surrendering the body and mind to God alone". 4). An example of a true Muslim is one who only faces Allah and turns away from others, not associating

13	Special Group: Strength comparison of both sides	Al-Alaq: 19 Al-Kafirun: 1-6 Al-Anfal: 30	Hold fast, commitment, and istiqomah to the principles of faith.
14	Group 13: Al-Birru	Ali-Imran: 92 Al-Baqarah: 177 Al-Infithar: 13 Al-Insan: 5-12 Al-Muthaffifin: 18-28 Al-Maidah: 2 Ali-Imran: 193 Al-Hasyr: 9	The importance of doing good to others. This group of verses is closely related to the 5th group of verses.
15	Group 14: Surah Al-Qori'ah	Al-Qori'ah: 6-11 Al-A'raf: 8-9 Az-Zalzalah: 7-8 An-Nisa': 40 Yunus: 61	On the Day of Judgment, humanity is faced with the Supreme Court on the Day of Judgment. Then asked about what was done and what was left behind to be counted or examined and compared.
16	Group 15: Surah Shaf's	Shaf: 2-3 Al-Baqarah: 44	The importance of doing what has been said. This is because making advice, opening your mouth, and listening to that advice is very easy. However, practicing it is very difficult, especially for people who still enslave themselves to lust.

From the 7 philosophies and 17 groups of Al-Qur'an verses which are Ahmad Dahlan's paradigm of thinking and acting, the researcher concludes that these aspects are not far from the divine aspects (tawhid, Islamic theology, and social aspects of society). All of them are part of the values and morals of the Qur'an and As-Sunnah. This main aspect then has implications for Public Education in Indonesia.

Social Theology and Theology of Al-Mā'un Ahmad Dahlan

In general, the popular social theology related to human liberation is Marxism, namely classless society. Marxist social theology is almost similar or even part of liberation theology. Marx tried to free workers from the arbitrary behavior of capital owners. (Thought & Agustina, 2022) Social theology which departs from socio-historical conditions is also usually called left theology or red theology. Theology that departs from religious dogma and tends to be normative is usually called right theology or green theology.

Even though it is popular and widely studied, Marx's thoughts have also received a lot of criticism,

especially from activists and religious figures. For Marx, religion is opium. This then has implications for worker alienation. According to Roger Garaudy, there are at least three factors why religion is said to be opium, first, a person's belief in religion will make him run to God if there is a problem. Second, a person only seeks God when he is difficult, weak and sad. Third, religious values are used as an anesthetic by the bourgeoisie for the oppressed. Nevertheless, Marx still has a big role and contribution in fighting for workers, especially in the concept and order of work which is a typical human activity. (Raioan & Randa, 2023)

Meanwhile, Islamic figures who initiated social theology related to the defense of people *mustadh'afin* among them are, 1). Hassan Hanafi with his Islamic left applies three methods (dialectics, phenomenology, and hermeneutics), (Nafi'ah, 2021; Muhammad Adress Prawira Negara, 2023; Zul Helmi, 2020) in formulating experimentation *at-turāts wa at-tajdīd* based on three agendas (Rosyadi, 2022), Asghar Ali Engineer's theology of liberation with "tauhid *"lā ilāha illā Allāh"*, al- Qur'an and Sunnah as basic concepts, movement as change and justice as a goal (Fanani, 2022; Muhammad Adress Prawira Negara, 2023; Muhammad Adres Prawira Negara, 2023), and Ali Shari'ati with his liberation theory based on humanism in Islam. (Ummah, 2020; Zaman Badrus Roja, 2021)

Meanwhile in Indonesia, Ahmad Dahlan is a figure who has social and humanitarian ideas based on the Al-Qur'an paradigm (or what has become known as al-Mā'un theology). This Al-Qur'an paradigm concept was later formulated as Prophetic Social Science by Kuntowijoyo. (Kuntowijoyo, 2006) The emergence of al-Mā'un's theological ideas was a form of manifestation of the PKO's generous (Penolong Kesengsaraan Oemoem) in 1920. The leader of the PKO at that time, Hadji Mohammad Soedjak, emphasized that the PKO used Islamic religious principles and did not divide religions. and the nation, the following is a quote from Hadji Mohammad Soedjak;

"Hadjatnja PKO itoe akan menolong kesengsaraan dengan memakai asas agama Islam dengan segala orang, tida dengan membelah bangsa dan agamanja".

That is, from Muhammadiyah which is based on Islam for universal humanity.

It is the values found in surat al-Mā'un that encourage Ahmad Dahlan and his students to be charitable (men of action, faith in action). This can then make Muhammadiyah a group with a modern philanthropic concept. Some examples of things that Muhammadiyah has done are reforming the management of zakat (alms giving), the concept of alms (donation) and Waqf (religious endowment). The Muhammadiyah Philanthropy social theology movement is defined as an invitation to care for others. This is one form of implementing Surah al-Mā'un. (Mubhar & Fahmi, 2023)

There are at least three main aspects in realizing al-Mā'un's theology as action, namely 1). Education, 2). Health, 3). Support for poor communities. In realizing the third point, there are three pillars of work that need to be done, namely 1). rehabilitation (health services), 2). schooling (education), 3). feeding (social services). With the points above, Ahmad Dahlan believes that social ills in Indonesia (damage to the realm of belief, freezing in the field of jurisprudence, decline in education, and poverty of the people and loss of local feeling) can be overcome (Mubhar & Fahmi, 2023)

Al-Mā'un's theology is a social theology based on al- Qur'an. Theology with the aim of equalizing social strata and positions in the style of Ahmad Dahlan, in the following period was widely discussed by Abdul Munir Mulkhan, after whom the term leftist theology emerged, namely the basis for defending the *mustadh'afin* people which departs from the individual towards social theory. (Huda, 2011) The implications of Ahmad Dahlan's ideas are widely felt in the social aspect. Furthermore, al-Mā'un's theology will have an impact on the education of Indonesian people regardless of religious background. Whether Muslim or not, as long as they are in need, Muhammadiyah will try to be there to help.

The background to the emergence of the term al-Mā'un Theology is the story of Ahmad Dahlan's students who continuously taught the al-Mā'un letter until the students felt fed up and bored. So, when one of the students raised his objection to the continuous repetition of material, Ahmad Dahlan responded to the student's question with another

question, do they remember the short letter? Then when the students admitted that they had memorized it, Ahmad Dahlan asked again, did they understand the content and purpose of the letter? When the students admitted that they had understood the contents and objectives, Ahmad Dahlan asked again, had they implemented and implemented the contents of the letter? It was from the third question that the students began to understand the reason why Ahmad Dahlan kept repeating the material from Surah al-Mā'un (Mulkhan, 2010)

Educational Concept and Implementation of al-Mā'un Theology in educational equality in Muhammadiyah.

Among the backgrounds that encouraged Ahmad Dahlan to promote education in Indonesia were dissatisfaction and anger over colonialism carried out by the Dutch. Ahmad Dahlan's efforts were then realized together with Muhammadiyah which then produced positive results regarding the concept of Modern Education in Indonesia. Ahmad Dahlan's goal is to focus more on developing a strong personality. Apart from the Development and Infrastructure aspects, Ahmad Dahlan also emphasizes the characteristics aspects of students, namely 1). Noble morals that include religious piety. 2). Broad-minded (a form of perseverance in various fields of knowledge studied. 3). Willingness to fight and benefit for the progress and benefit of the people. (Achmad, 2021)

In implementing the curriculum, Ahmad Dahlan is one of the pioneers in Indonesia who integrates religious knowledge and general science. This concept of pedagogy was then brought by Ahmad Dahlan into the Muhammadiyah organization with the aim of reconciling the direction of Islamic boarding school education at that time and the direction of Dutch school education. According to him, Islamic education must have a mission to develop true Muslims who have devotion to Allah as a person *abdullah* and *khalīfatullāh* on the face of the earth. (Achmad, 2021)

Ahmad Dahlan has implemented the concept of equal distribution of education in Indonesia in order to create a social order that is not unequal. In order to spread Islamic teachings and its reform aspects,

Ahmad Dahlan taught in Dutch schools. Meanwhile, for those who cannot afford school education, they can attend the surau or langar where Ahmad Dahlan conducts recitations and preaching to the general public.

Furthermore, Muhammadiyah continues to carry Ahmad Dahlan's ideas regarding educational equality in Indonesia. This can be seen from Muhammadiyah's efforts to provide subsidies and scholarships for the general public, especially for ethnic groups *mustadh'afin*. Through LAZISMU (Institute 'Amil Zakat, Infaq, and Shadaqah Muhammadiyah), both central, branch and campus levels, are committed to providing education to them *mustadh'afin* or groups who find it difficult to receive education in Indonesia.

Conclusion

This research concludes that there are 17 groups of verses from al- Qur'an formulated by KRH. Hajdid is a driving force behind Ahmad Dahlan's enthusiasm to eradicate tuberculosis, equalize the social order and offer equal distribution of education in Indonesia. Of the 17 groups of verses, Surah al-Mā'un has a big role for Ahmad Dahlan. This form of embodying al- Qur'an from text to action was then continued by the Muhammadiyah Association to this day.

Among the examples is Muhammadiyah's efforts to provide subsidies and scholarships for the general public, especially for ethnic groups *mustadh'afin*. Through LAZISMU ('Amil Zakat, Infaq, and Shadaqah Muhammadiyah Institute), Muhammadiyah is here to contribute to the equality of education in Indonesia. This is also intended to equalize the social order of society so that there is no inequality between one another.

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Improving The Leadership Spirit of Santri Ma'had Ali Krapyak Yayasan Ali Maksum Yogyakarta Through Wayang

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Abstract: It is important for every child of the nation to awaken their leadership spirit, including the students of the *Ma'had Ali Krapyak Ali Maksum Foundation Yogyakarta*. The aim of the research is to find out how the efforts to awaken the spirit of leadership of the *Ma'had Ali Krapyak* students of the *Ali Maksum Yogyakarta Foundation* through *wayang* are also to find out its success. The research method was carried out using wayang: the researcher performed a puppeteer with the play *Kyai Alamtara* with the theme of preaching to the people, the students of *Ma'had Ali Krapyak* of the *Yogyakarta Ali Maksum Foundation* watched it. Research results: 1. Awareness of the leadership spirit of the *Ma'had Ali Krapyak* students of the *Yogyakarta Ali Maksum Foundation* through wayang, done in the following poses: a. *gupuh* (thinking about the concept of wayang), b. *lungguh* (realizing the concept of wayang), c. *suguh* (presenting puppets), and d. *Aruh* (asking about success after seeing the wayng). 2. The effort to awaken the leadership spirit of the *Ma'had Ali Krapyak* students of the *Yogyakarta Ali Maksum Foundation* through *wayang* was successful, the students were aware of or remembered his leadership spirit.

Keywords: Awareness, soul, students, *wayang*.

Introduction

Every child of the nation (human), including the students of *Ma'had Ali Krapyak* of the *Ali Maksum Yogyakarta Foundation*, is important to be made aware of their leadership spirit. Not because they are not aware or not yet aware, but because awareness must be repeated¹, and awareness also has levels²: "above consciousness there is awareness³", "above consciousness there is consciousness", "above the sky there is the sky⁴", just as faith also has levels, until Allah says in the *Qur'an Surah An-nisa* verse 136: "*yaa ayyuhalladziina amanuu aaminuu...*: O you who believe, have faith⁵:

you have believed but are still being told to believe again.

It is important to awaken the leadership spirit of these people, including the students of the *Ma'had Ali Krapyak Ali Maksum Foundation Yogyakarta*, because every human being is a leader⁶, so they will be the ones who will lead this country in the future.

Nabillah⁷ asked a question and the answer in general, what would be the atmosphere and condition of this nation if it were led by generations who were not aware of their leadership spirit?

The students of *Ma'had Ali Krapyak* of the *Yogyakarta Ali Maksum Foundation* have always been aware of his leadership spirit. However, because you are aware, as has been conveyed in sharing the expressions above, it is important to be made aware so that you are even more aware.

They are students of the *Ma'had Ali Krapyak Ali Maksum Yogyakarta Foundation*. If you look closely,

¹ Istaria, 2021. Periodicals of Archiology Vol 212 (2), 48.

² Irhandayaningsih, 2018. Jurang Blimbim Tambalang Community. ANUVA Volume2 (1), 19-27.

³ Nasir. Purba, Amal, 2021 Internasional Journal of Aquatic. Science 12 (03), 215-224.

⁴ Nahak Hildigardis, 2019. Jurnal Nasional Nusantara Vol. 5, no. 1.

⁵ Qur'an Surat Annisak, ayat 35

⁶ Masroer, 2015: 15.

⁷ Nabilah, 1996: 42

there are many clues to the awareness of their leadership spirit⁸. However, if we look closely, there are still hints of unconsciousness in his leadership spirit, even though it is only a "small virus".

This research will try to raise awareness of the leadership spirit of *Ma'had Ali Krapyak* students of the *Yogyakarta Ali Maksum Foundation* through *wayang*. Furthermore, based on the questions: 1. How to awaken the leadership spirit of the *Ma'had Ali Krapyak* students of the *Ali Maksum Yogyakarta Foundation* through *wayang*? can be finished with all the existing answers.

Theoretical Study

1. Awareness of the Spirit of Leadership

Awareness of the spirit of leadership, awareness comes from the word conscious⁹; is an attempt to make something, whether an animal or a human, aware or remember something. Conscious in the animal sense is only physically conscious, but conscious in the human sense, it can be physical or physical¹⁰. Conscious in the physical sense, is conscious, usually just conscious or remembering¹¹, but conscious in the physical sense, is being aware or remembering what is good to do¹². When you don't remember something good to do, it means you are negligent. Because of this, there is an expression that says: "to make people aware who are being careless¹³". Awareness as an effort to make negligent people remember the good things to do, is a process¹⁴.

The spirit of leadership is a good thing to do. There are many points of goodness to do, but the essence is only 2, namely 1. invite goodness (invite goodness to others or preach), and 2. do good (do good for yourself or

worship¹⁵). Furthermore, the goodness to be done must exist in human life¹⁶, and this cannot possibly exist without humans being aware of this goodness¹⁷.

2. *Santri Ma'had Ali Krapyak, Ali Maksum Foundation Yogyakarta*

The students of the *Ma'had Ali Krapyak Yogyakarta Ali Maksum Foundation* are mostly students who board at the Yogyakarta Krapyak Islamic boarding school¹⁸. Islamic boarding school is an institution that educates its students to have an Islamic personality (the personality of someone who is obedient to their Creator), so that their curriculum refers a lot to *Qur'an-Hadith* materials, the implementation of which is aimed at the goodness of preaching and worship¹⁹.

They (the students who board at the Krapyak Islamic boarding school), are like ordinary people who must be made aware again and again of their leadership spirit, both in preaching and worship. They are also around 20 years old. At around 20 years of age²⁰, according to Gazali, he is at the peak of searching for identity, so whatever the stimulus, including if it is made aware in some way, it will definitely respond well²¹.

3. *Wayang*

Wayang is a puppet show made from buffalo or ox skin whose presentation can be manipulated (created) in such a way that the shape suits one's needs²². *Wayang* as a puppet show made from buffalo or ox skin, its form can be explained: related to time, story, furniture, actors, and presentation operations.

Regarding time, it varies depending on the form of the *wayang*. If it's an overnight

⁸ Interview with *Kyai Hilmi* teacher *Ma'had Ali Krapyak Ali Maksum Foundation Yogyakarta*, February 22, 2023..

⁹ Big Indonesian Dictionary, 2001.

¹⁰ Damarjati Supajar, 2012: 16.

¹¹ Setiawan Eko, 2020.

¹² Cah Angon, 2010:12

¹³ Wardana, ND:17.

¹⁴ Cipto Hendro Puspito, 83: 19

¹⁵ Indriyanto A, Sumarmo, Swastika, 2018: 18-91.

¹⁶ Murtiyoso, 1999:12

¹⁷ Damardjati, 2007:V

¹⁸ Interview with Galih, ustadz of Krapyak Islamic Boarding School, May 22, 2023

¹⁹ interview with Zen, ustadz of Krapyak Islamic Boarding School, February 22

²⁰ How to get to *Ma'had Ali Krapyak Yogyakarta*, 2022/2003

²¹ Gazali, 1958:12.

²² Soetarno, Sunardi, Sudarsono, 20278:45

wayang form, the time is 8 hours, if it's a compact wayang or *madyarati*²³ (midnight) wayang, it's 4 hours, and if it's a compact wayang it's only 2 or 1 hour²⁴.

Regarding stories, basically there are only two types, namely the *Mahabarata* and the *Ramayana*. However, the branches of the two main stories vary. From the *Mahabarata*, there are revelation stories, stories, *lairan* (birth), *raben* (marriage) stories, graduation stories (graduation), *lena* or falling (death) stories, or now more of the will of the times, meaning far from the standards (guidelines) that There is. Meanwhile, from the *Ramayana* there are stories of *Sinta obong* (Sinta self-immolation), *Anoman Duta* (anoman becomes a messenger), *Anila-Prahasta*, and so on. In contrast to the *Mahabarata*, the *Ramayana* story is less based on the will of the times, meaning it still adheres to its standards.

Regarding puppet presentation furniture, the main ones are wayang and gamelan. For this gamelan, the main thing is *Slendro*, while *Pelog* is just an addition. That is, *Slendro* is not a problem, but *Pelog* is not common.

In relation to those who perform wayang presentations, the main ones are the puppeteers, the others are just helpers. Others referred to, there are *peladi* (puppeteer servants), *niyaga* or *pengrawit* (gamelan musicians), *pesindhen* (female singers), *penggerong* (male singers). In relation to the perpetrators, the puppeteer also wears *blangkon* (head covering), *surjan* (clothes), *jarit* (cloth as a lower covering), as well as *peladi*, *pengrawit*, and *penggerong*. *Pesindhen* wear *kebaya* clothes with a bun. But for certain purposes you can adjust your clothes,

In relation to wayang operations, wayang starts from the row scene, *Limbukan* (scene of *Limbuk-Cangik* characters), *paseban njawi* (scene of soldiers in the field), *sabrang* scene (scene of characters on the other side), failed war (first

war), *gara-gara* (funny scene *Semar*, *Gareng*, *Petruk*, and *Bagong*), flower war (war of knights against giant *cakil*), *Manyura* scene (scene in *Manyura pathet*), *Manyura war* (war in *Manyura pathet*), rampage war (last war in *Manyura pathet*), at the end of the tanceb kayon scene (the last scene in *Manyura's pathet*). However, puppets currently adapt to the audience. As for the audience at the moment, it is instant, meaning it has the desire that the sooner the better, or quickly, concisely, solidly, concisely, but with results²⁵. Therefore, the puppets also adapted, especially in terms of time, until there were overnight puppets, compact puppets and compact puppets.

Materials and Methods

It cannot be denied that efforts to awaken the leadership spirit of the *Ma'had Ali Krapyak* students of the *Ali Maksum Yogyakarta* Foundation are always carried out by the Islamic boarding school, both using academic activity methods and non-academic activity methods²⁶.

It is hoped that academic activities and non-academic activities as a method, directly or indirectly, can awaken the leadership spirit of the *Ma'had Ali Krapyak* students of the *Yogyakarta Ali Maksum* Foundation. However, whatever and how many methods have been used so far are not enough, this means that there are still other methods that can be used, including the wayang method.

This research will try to awaken the leadership spirit of the *Ma'had Ali Krapyak* students of the *Yogyakarta Ali Maksum* Foundation using the wayang method, where the researcher plays this method, the *Ma'had Ali Krapyak* students of the *Ali Maksum Yogyakarta* Foundation see it. The process carried out is to borrow the theory of being a good

²³ istilah Suminta, ketika memberi sambutan *nanggap* wayang purwa setengah malam dalam rangka Dies Natalis UNY 2023 pada <https://www.google.com/search?q=Wayang+...>

²⁴ Soetarno, Sunardi, Sudarsono, 20278:45

²⁵ Yusuf Kala's term: vice president of the Republic of Indonesia in launching the National Action Plan in June 2018, on <https://sdgs.bappenas.go.id>

²⁶ Interview with *Kyai Imanuddin* caretaker of *Ma'had Ali Krapyak Ali Maksum* Foundation Yogyakarta, 15 May 2023

host from the Javanese people in Hadi Atmaja²⁷, namely: *gupuh*, *lungguh*, *suguh*, and *aruh*.

1. *Gupuh* means kicking or kicking quickly, the meaning in this case is thinking about the concept of how to provide good wayang material to the students of the *Ma'had Ali Krapyak Ali Maksum Foundation Yogyakarta*,
2. *Lungguh* means sitting, the meaning is to realize the concept so that it becomes good material to be given by the *Ma'had Ali Krapyak Ali Maksum Foundation Yogyakarta*,
3. Treat, meaning to give a treat, the meaning is to provide good material that already exists. And
4. *Aruh* means greeting, which means asking about things after the students of the *Ma'had Ali Krapyak Foundation Ali Maksum Yogyakarta* were given the wayang material. The questions asked are made in such a way in the questionnaire as follows.
 1. How do you see the *wayang* being presented, do you like it or not?
 2. After seeing this *wayang*, you then think about whether the people are there or not?
 3. After seeing this *wayang*, if you were asked to see another wayang, are you ready or not?

The success of awakening the leadership spirit of the *Ma'had Ali Krapyak* students of the *Ali Maksum Yogyakarta* Foundation using the wayang method in this research, or in other words, the *Ma'had Ali Krapyak* students of the *Ali Maksum Yogyakarta* Foundation after seeing this *wayang* are said to be aware of their leadership spirit, if indicated as follows.

1. Students return the questionnaire with the answer: "happy" in question 1 reaching 75 0/0 or more.
2. Students return the questionnaire with the answer: "Yes, there are people who think" in question 2 reaching 75 0/0 or more.
3. Students return the questionnaire with the answer "ready" on question 3 reaching 75 0/0 or more.
4. The total number of indications reaching 1, 2, 3 reaches 75 0/0 or more

Results and Discussion

Implementation of Awareness of the Leadership Spirit of Santri Ma'had Ali Krapyak Yogyakarta Ali Maksum Foundation Through Wayang

On Monday, March 1, 2023, the researcher lobbied the boarding school caretaker (Ustadz Zen) through the "door" of the Krapyak student alumni (Sa'adah) who studied at UNY majoring in Dance Education. After meeting, then convey your intentions for research. To this intention, Zen *ustadz* accepted it openly.

On Wednesday, March 3 2023, researchers surveyed facilities that could be used for puppetry with Zen *ustadz*. In the survey, it turned out that there was a gamelan that was so beautiful that it was new, it was said to have been donated by GKR Hemas, Yogyakarta palace²⁸, which was rarely played (used), so I really wanted to play it immediately or use it, including for wayang in later research.

On Monday, April 12 2023, the researcher randomly met teachers or *ustadz Ma'had Ali Krapyak* of the *Ali Maksum Yogyakarta* Foundation, at which time after meeting, the researcher was invited to a discussion in the boarding room. As for the results, the teachers were very open to accepting the presence of the researcher with all the planning, only having to go through a process including *sowan* (coming before) the highest caregiver (Pak Kyai). From the deliberations with the teachers, the researcher would like to convey this to Mr. *Kyai*.

On Saturday, April 24, 2023, the researcher sat together with the existing teachers, discussing (thinking) about the concept of *wayang* including the play and *gamelan* that will be used, as well as about the technical implementation of *wayang* such as place, time, and who should invited, in this case including *Kyai*, caregivers or teachers and their students. In essence, this sitting together was done to organize the concept.

On Monday, April 26 2023, the researchers sat together again with the teachers to realize the concept of *wayang* material that had been discussed together. At the end of this sitting together, in the

²⁷ Hadiatmaja, 2011:14.

²⁸ interview with *ustadz Zen*, May 3, 2023

course of time a script for the *wayang* play *Kyai Alamtara* with the theme of preaching thought to the people was written, complete with a scenario and ready to be presented.

Thursday, May 11 2023, 20.00-22.00 is the peak day for carrying out the most important research, namely *wayang*. This puppet was performed by researchers in the play *Kyai Alamtara* with the theme of preaching to the people, the students of *Ma'had Ali Krapyak* of the *Ali Maksum Yogyakarta Foundation* saw it. In summary, *Kyai Alamtara's* puppet play is as follows, Pendawa welcomed the arrival of *Kyai Durna*, then asked about when the Kalabendu era would come. *Kyai Durna* could not answer, only gave signs, including the appearance of *Kyai Alamtara*. After *Kyai Durna* returned to the Sokalima Islamic boarding school, *Kyai Alamtara* came. How surprised the Pandavas were, because the signs indicated that the Kalabendu era had come. Therefore, the Pandavas then gave worship, the rest would learn and follow him.

Against the wishes of the Pandavas, *Kyai Alamtara* invited him to establish a Islamic boarding school in Ngargacepata. The Pandavas wanted to, and then followed him. After being given instructions (*bayar hidayah*) on how to preach, they then departed in an orderly manner.

Kyai Alamtara's efforts to preach and establish an Islamic boarding school, as was done, *Batara Guru*, who considered himself to be God, was not pleased, so they were considered treason and put in the Candradimuka Crater.

When *Kyai Alamtara* was put into the Candradimuka crater, his students were unwilling and attacked him until *Batara Guru* was helpless. In such helplessness, *Kyai Alamtara* helped him but with the condition that he repent and no longer claim to be God, because the only God is *Allah SWT*.

To this condition, *Batara Guru* complied, and then *i'lan* (informed) humans so that they would no longer worship themselves. After *Batara Guru i'lan* finished, *Kyai Alamtara* prevented his students from attacking him again. Furthermore see youtube:

<https://www.youtube.com/watch?v=NWrdez0xGaU>.

While the students were looking at the *wayang*, the researcher collaborated with his *ustadz* to provide a questionnaire containing questions to be answered (filled in). Once answered (filled in), it is then withdrawn. The answers provided were then examined or analyzed based on the researcher's success in efforts to awaken the leadership spirit of the students.

Discussion

1. Process of Awakening the Leadership Spirit of Santri Ma'had Ali Krapyak, Ali Maksum Foundation Yogyakarta Through Wayang

a. *Gupuh*

Gupuh or thinking about concepts, is carried out from the beginning before the research until the research begins (March 1-April 24, 2023). Early before the research (after observing the existing situation and conditions), the researchers gathered together to discuss the concept of how to provide good *wayang* services for the students of the *Ma'had Ali Krapyak Ali Maksum Yogyakarta Foundation*. Gathering together again and again like that, done several times. Once the concept is deemed sufficient, a proposal is created, then uploaded to be submitted as a research plan.

Research begins, precisely after the proposal is accepted, then researchers gather together again and again to think and discuss the details of the concept that has been created. Among the details of the concept that has been created are related to various things such as related types of *wayang* material, and related students of the *Ma'had Ali Krapyak Foundation of Ali Maksum Yogyakarta*. The type of *wayang* related in this case is the narrative of *Kyai Alamtara's* play, the narrative is made in such a way as to the theme of preaching Islamic thought to the people.

Other concept details relate to students. Regarding the *Ma'had Ali Krapyak* students of the *Ali Maksum Yogyakarta Foundation*, 30 of them were selected. So they were selected as many as 30 who were deemed to be able to differentiate between good and bad, unless their capacity was very limited.

Other conceptual details are how to assess the success of research. The way to assess the success of research relates to the students of *Ma'had Ali Krapyak* from the *Ali Maksum* Foundation of *Yogyakarta* who were invited, for example, the students of *Ma'had Ali Krapyak* from the *Ali Maksum* Foundation of *Yogyakarta* were not just invited, but were also provided with sufficient knowledge to watch *wayang*,

Apart from being provided with sufficient knowledge to watch *wayang*, as well as in relation to the questionnaire, the researchers made questions that were easy for the *Ma'had Ali Krapyak* students of the *Ali Maksum* *Yogyakarta* Foundation to understand, so that they could provide answers according to the desired questions.

In relation to capturing statements that are useful or not from the participants, sentences are also made that are easy to understand, so that the students give answers according to the statements given.

In order to produce an agreement whether we can carry out *wayang* appreciation at another time or not, a program is created that leads in that direction, such as a mahabbah meeting (casual meeting full of affection) after the *wayang* appreciation service is completed.

b. *Lungguh*

Lungguh or materialize a concept into material, in this case a manuscript (Date 26 April 2023). Realizing the concept until material (manuscript) was formed was carried out by holding meetings with the researchers and the teachers of the *Ma'had Ali Krapyak* Islamic boarding school students from the *Ali Maksum* *Yogyakarta* Foundation several times. What is discussed is: 1). about the composition of the play, 2), the composition of the accompaniment, 3). work between play and accompaniment, 4). application to work on the play and accompaniment, 5). presentation 1, 6). 2nd presentation with various suggestions, and 7). 3rd presentation (finishing), the manuscript material is ready for the students to see.

c. *Suguh*

Suguh or providing material, in this case the researcher is performing a play by *Kyai Alamtara* with the theme of preaching the thoughts of the people on Thursday, May 11 2023, at 20.00-22.00. The process for providing this material is as follows:

- 1). The researcher reminded the existing agreement with the *Ma'had Ali Krapyak* Islamic boarding school teachers at the *Yogyakarta Ali Maksum* Foundation, that this day the students were to see *wayang*.
- 2). The teachers of the *Ma'had Ali Krapyak* Islamic boarding school students at the *Yogyakarta Ali Maksum* Foundation told their students to see *wayang*. The students then saw the puppets accompanied by the existing teachers.
- 3). The researcher masterminded the play *Kyai Alamtara* with the theme of preaching to the people, the students of the *Ma'had Ali Krapyak Ali Maksum* Foundation *Yogyakarta* saw it.

d. *Aruh*

Aruh or ask about things after being given *wayang* material (11 May 2023). To be clear, after the *Ma'had Ali Krapyak* students of the *Yogyakarta Ali Maksum* Foundation were given material on *wayang*, which also means that after seeing the *wayang*, they were then asked about their awareness of their leadership spirit through a questionnaire. This is done to determine success in awakening the spirit of leadership.

2. Success in Awakening the Leadership Spirit of *Santri Ma'had Ali Krapyak, Ali Maksum* Foundation *Yogyakarta* Through *Wayang*

The success of awakening the leadership spirit of *Ma'had Ali Krapyak* students of the *Yogyakarta Ali Maksum* Foundation through *wayang* based on the indications that have been made is as follows: ,

- a. The students returned the questionnaire with the answer: "happy" in question 1 reached 75 0/0, even 100 0/0 (30 children).
- b. The students returned the questionnaire with the answer: "Yes, there are people who think" on question 2 it reached 75 0/0, even 100 0/0.

- c. Students returned the questionnaire with the answer "ready" on question 3 reaching 75, even 100 0/0.
- d. The total number of indications reaching 1, 2, 3 reaches 75 0/0 and even 100 0/0.

Conclusions

1. Process of Awareness of Leadership Spirit of Santri Ma'had Ali Krapyak Yogyakarta Ali Maksum Foundation Through Wayang
The process of awakening the leadership spirit of the *Ma'had Ali Krapyak* students of the *Yogyakarta Ali Maksum Foundation* through *wayang*, was carried out with *gupuh*, *lungguh*, *suguh* and *aruh*.
 - a. *Gupuh* is done by thinking about the initial concept before carrying out the research until the research begins.
 - b. *Lungguh* is done by turning a concept into material, in this case the wayang play script by *Kyai Alamtara* with the theme of preaching the thoughts of the people.
 - c. The show is done by providing material, in this case providing material for *wayang* (puppetry researchers) with the play *Kyai Alamtara* with the theme of preaching to the people's thoughts.
 - d. The influence was carried out after the students of the *Ma'had Ali Krapyak Yogyakarta Ali Maksum Foundation* were given *wayang* (seeing puppets), then asked about their awareness of their leadership spirit through a questionnaire.
2. Successful Efforts to Awaken the Leadership Spirit of Santri Ma'had Ali Krapyak Ali Maksum Yogyakarta Foundation Through Wayang
The effort to awaken the spirit of leadership of the *Ma'had Ali Krapyak* students of the *Yogyakarta Ali Maksum Foundation* through *wayang* was successful. This means that the students of *Ma'had Ali Krapyak* of the *Yogyakarta Ali Maksum Foundation*, after seeing the *wayang* being presented, then realized or remembered his leadership spirit. This can be seen from the existing indications:

- a. The students returned the questionnaire with the answer: "happy" in question 1 reached 75 0/0, even 100 0/0 (30 children).
- b. The students returned the questionnaire with the answer: "Yes, there are people who think" on question 2 it reached 75 0/0, even 100 0/0.
- c. Students returned the questionnaire with the answer "ready" on question 3 reaching 75, even 100 0/0
- d. The total number of indications 1, 2, 3 reaches 75 0/0 and even 100 0/0.

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- Kyai Imanuddin (caretaker of *Ma'had Ali Krapyak Ali Maksum* Foundation Yogyakarta)
- Kyai Zen (Guardian of the *Ma'had Ali Krapyak* students of the *Ali Maksum* Foundation Yogyakarta)
- Sa'adah (Caregiver of the female students of *Ma'had Ali Krapyak Ali Maksum* Foundation Yogyakarta)
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Investigating The Cognitive Level of English Test Developed by English Teacher

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Abstract: This study deals with investigating the English test randomly in senior high school. There are five randomly questions of English test of 10th grade in 2021/2022 academic year. Documentation is the main instrument of this study. The result of this study shows that the percentage of cognitive levels of English test of 10th grade in 2021/2022 academic year that there are 60% of remembering (C1), 40% understanding (C2), meanwhile applying (C3), analyzing (C4), evaluating (C5) and creating (C6) are 0%. In addition, the results obtained percentage of LOTS, MOTS, and HOTS of English test question as follow there are 60% of questions that are categorized as LOTS, 40% of questions are categorized into MOTS, and 0% of questions are categorized into HOTS. Therefore, the quality of the English randomly is categorized remembering (C1) or LOTS level.

Keywords: Cognitive Level, English Test.

Introduction

The English language has become one of the important subjects that must be acquired in most education schools in Indonesia, especially at the Senior High School level. However, English language becomes one of subjects that must be tested in national tests beside Mathematics, Science and Bahasa. In the process of learning English to know whether the students understand or not about the material that the teacher has explained before, the teacher should give an evaluation at the end of the learning process. The results of the process of teaching and learning activities will require assessment (Archer, 2017). It is an important part of the teaching-learning process because it provides input to teachers and students about the learning process and student outcomes. By conducting an assessment, teachers can obtain valuable information related to the effectiveness of the learning process (Mehta & Mokhasi, 2014). In addition, through the assessment the teacher can assess whether or not the learning objectives have been achieved and determine student achievement.

Therefore, assessment is very important in seeing the success of learning and seeing the abilities achieved by students after participating in the learning process.

In this assessment process, information is needed to know student achievement (Yumelking, 2019). In addition, there are some approaches that are necessary to assess the students' achievement or to collect the learning outcomes of students (Ali & Ruit, 2015). Teachers have to carry out the students' results (Subia et al., 2020). In other words, assessment is a comprehensive process that is carried out continuously to collect student performance information to determine student achievement in the learning process (Mohammedid & Omar, 2020). Furthermore, Anderson et al (2001) classify thinking levels into three, namely low-order thinking skills (LOTS) which includes the dimensions of thinking processes; remembering and understanding, intermediate-level thinking skills (MOTS) which include the dimensions of thinking processes; apply, and higher order thinking skills (HOTS) include the dimensions of

thinking processes; analyze, evaluate, and create (Hartini et al., 2021). This cognitive level gradually increases from a simple level to a complex level of thinking. Therefore, an assessment must be able to measure students' skills ranging from low-level thinking to higher-order thinking (Styvani, 2022).

In the implementation of the test, there is a school that uses the 2013 Curriculum and holds an exam test at the end of the semester with multiple choice questions. Unfortunately, some teachers are less concerned about constructing a good assessment. Consequently, there are still many tests that only assess the lower levels of thinking and the questions have not been tested so the quality is not known and it is feared. Considering the problem above, there is a need for studies and trials at the end of the test to know the percentage of cognitive level of the questions. The research that will be conducted by researchers uses Taxonomy Bloom which was revised by Anderson et al., (2001) to determine the type of questions designed by English teachers and to gain the percentage of HOST questions and into classical measurement theory 5 on a multiple choice test which includes an index of difficulty level, inequality index, and distractor effectiveness.

Materials and Methods

Research Design

The researcher uses a descriptive qualitative method. Therefore, in this study, the researcher randomly analyzed English test questions designed by an English teacher in senior high school based on Taxonomy Bloom which was revised by Krathwol and Anderson (2001). The analysis aims to know the type of questions designed by English teachers and to gain the percentage of HOST questions. The researcher investigates the cognitive level of English test questions.

In addition, the data sources from the randomly selected English test questions in senior high school. Then, data from this study is five random English test questions consisting of 10th grades in the academic year 2021/2022. Therefore, the data collection technique in this study is to use the documentation. The documentation in this study is

that the researcher collects all the data which are randomly English test questions from the English teachers at 10th grade in high school.

Data Analysis

The researcher eliminates unnecessary data which does not meet the category of questions that can be analyzed. Then the researcher categorizes each question into criteria of six cognitive levels based on Bloom's Taxonomy revised, the level consisting of understanding (C1), remembering (C2), applying (C3), analyzing (C4), evaluating (C5) and creating (C6). The researcher analyzes each question which has been categorized into level C1, C2, C3, C4, C5 and C6. Then, researcher calculates the percentage of HOTS questions using the following formula:

P = percentage of English exam questions

$N1$ = number of questions in each cognitive domain

$\sum n$ = the total number of English exam questions

Arikunto (2008, as cited in Dharmawati, 2018)

$$P = \frac{\sum N1}{\sum n} \times 100\%$$

Results and Discussion

The Result of Cognitive Level of English Tes

Based on five English questions for the 2021/2022 academic year, researchers investigated the items at the cognitive level and classified the percentages at the taxonomic level. The following is a classification table of cognitive level.

Table 1. Classification of Cognitive Level

No	Test Item	Indicators	Cognitive Level
1	Who are involved in the dialogue?	Recalling the spesific in the text.	C1
5	What are they talking about?	Recalling the spesific in the text.	C1
6	What is the descripti on of the girl?	Recalling the spesific in the text.	C1
9	I don't bring ___ pen, please lend ___ me.	Writing the best possible answer to fill into the sentence.	C2
15	Please, put the food on the table, ___is special food.	Writing the best possible answer to fill into the sentence.	C2

This table shows the percentage of cognitive levels of the English test of 10th grade in the 2021/2022 academic year. It can be seen that there are 60% of remembering (C1), 40% understanding (C2), meanwhile applying (C3), analyzing (C4), evaluating (C5) and creating (C6) are 0%. In addition, the following is a percentage table of cognitive level.

Table 2. Percentage of Cognitive Level

No	Cognitive Level	Number Of Question	Total	%
1	Remembering (C1)	3	30	60%
2	Understanding (C2)	2	20	40%
3	Applying (C3)	0	0	0
4	Analyzing (C4)	0	0	0
5	Evaluating (C5)	0	0	0
6	Creating (C6)	0	0	0

This table shows the percentage of cognitive levels of the English test of 10th grade in the 2021/2022 academic year. It can be seen that there are 60% of remembering (C1), 40% understanding (C2), meanwhile applying (C3), analyzing (C4), evaluating (C5) and creating (C6) are 0%.

Discussion

This study is aimed to find out the type of cognitive level of the English test. Based on the result of the analysis, it found that 60% of five questions randomly are categorized into LOTS and 40% are categorized into MOTS. (Muhayimana et al., 2022) says that the proportion of good questions should have the ratio level of difficulty 30:40:30 meaning 30 for low level, 40 for medium level and 30 for high level. Therefore this standard is interpreted into thought process level so that the

proportion of cognitive level should have been contained in the English test where LOTS is 30%, MOTS is 40% and HOTS is 30%. Furthermore, (Cheng et al., 2021) emphasizes that the cognitive level of students is not driven at one level but must be balanced between remembering, understanding, applying, analyzing, evaluating and creating. However, from the results it was found that the questions were not balanced between LOTS, MOTS and HOTS cognitive levels. (Hamdu et al., 2020) emphasize that the cognitive type of critical thinking is important in the type of test used because it is very influential on students to solve problems in the learning process. Besides, the composition of the exam questions should be balanced, as has been explained that the exam questions must cover all cognitive levels. In fact, the finding above shows that the distributions of LOTS, MOTS, and HOTS haven't met that standard. So according to the statement above, it can be said that the random English test in senior high school has not been categorized in the good questions because good questions should be able to assess different levels of thinking. A well-designed assessment and in accordance with the level of thinking ability can improve a student's thinking power, especially critical thinking (Styvani, 2022). Thus, from the results of the explanation above, it can be concluded that the teacher must improve the quality of the question, in this case the use of the cognitive level in the English test, especially HOTS.

Conclusions

This study attempts to investigate the cognitive level of randomized English test questions designed by an English teacher in senior high school. The data analysis used in this research is qualitative analysis where the research results are described descriptively. The data used is a random English test at 10th grade senior high schools for the 2021/2022 academic year. Analysis result show that among the five questions at random there are 3 questions (60%) belonging to remembering level, 2 (40%) including understanding level, and 0% including application level (C3), analyzing level (C4), evaluation level (C5) and creating level (C6).

Also from the above results obtained percentage of LOTS, MOTS, and HOTS of English exam questions. As follows there are 60% of questions that are categorized as LOTS, 40% of questions are categorized into MOTS, and 0% of questions are categorized into HOTS. Therefore, it can be concluded that randomized English tests in secondary schools were dominated by the lower class thinking questions.

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The Importance of Education for Women to Support Family Economy

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Abstract: This study aims to see if a woman's education is important for her life. Some cultures say that a woman doesn't need to have a high level of education if she's about to become a housewife. Islam commends its ummah to be intelligent and educated at the same time it tells the muslimah to take good care of her family at home. This study used qualitative method with ground theory approach to confirm a theory that a woman needs education to support her family economy whether she works fulltime at the office or is a stay at home mother. A woman needs to have a sufficient education for herself and her family. A good education enables a woman to be a better wife and mother and eventually is beneficial for her family's economy condition. The result shows that all 25 respondents agreed on the statement and they believed their level of education gives benefits to their husband and children welfare in terms that, an educated woman builds stronger and more planned family including its economic plans in the future, she would make an efficient mom who handles her household chores well, and she could be a good partner for her husband to organize their family and support her husband's career as well as her own career and ensure her children to have a better life than theirs at the moment. This research should make a preliminary article that focus on the benefits of education for her role in social welfare.

Keywords: Beneficial, Economy, Education, Family, Women.

Introduction

Education is a non-physical investment and much beneficial for human life. These benefits can be for themselves or their environment. Thus, it is called human capital. It was Gary Becker who presented the term for the first time on his book Human Capital (Becker 1993). Women, as well as men, are Allah's creation that have the equal status. Although Allah elevates men one degree because of their leadership qualities, in many contexts Allah mentions the privileges of women and how He gives equal rewards to men and women in the form of paradise and His Love if they are pious. Allah gives the same duties to the two genders to worship Allah and be khalifah on earth. As Allah said:

فَاسْتَجَابَ لَهُمْ رَبُّهُمْ أَنِى لَا أُنْبِىْعُ عَنْكُمْ عَمَلٍ غَيْرِ مَنْكُمْ مِنْ ذَكَرٍ أَوْ أُنْثَى ۖ بَعْضُكُمْ مِنْ بَعْضٍ

"Indeed, I do not waste the deeds of those who do good among you, whether male or female, (because) some of you are descended from others."
(Al-Imran:195).

In term of human capital, a woman is definitely an asset that needs to be considered precious. Things that can add values to human capital applied to women as well as men. In the global point of view, the better quality of the human capital the more the efficiency and productivity of a country increases. So women also have a big role in supporting the country's economy at a macro level. While there are still opinions on women's destiny to be a wife and later a mom, so they do not need

to pursue higher education, there are past researches done by the scholars showing how important high education is for a woman's life. Waqidil Hidayah and Adini Ck said that educated mothers pay more attention to the growth and development of their children in the golden period, while Leah Witcher found that the world needs to focus on women's education to fight poverty and to achieve global economic growth and development and social development. Other study from Australia concluded that higher education created a happier woman that would make her a more useful for other human beings. From the Middle East Countries, the world recorded the story of Fathima Al Fithriyah and Nana Asma'u as intelligent women who had great influences on the social and political benefits of her environment (Farida et al. 2022; Hidayah & CK 2016; Jackson 2009; Nazlı 2022; Tran et al. 2021). Kadambari Rana and Linda Eisenmann also reminded how important it is to get the women on high education because of the roles that they carry whole their lives as themselves, as wives or as moms (Kadambari 2022; Eisenmann 2022). Thus, we may agree on what Julia Gillard and Cate Blanchett wrote that educating girls and women is especially effective because when we educate them, they will share the benefits to their closest community. It's a magic multiplier in the development equation. An educated woman is better able to educate her own children. The family will likely be healthier, with a lower prospect of infant mortality and better maternal nutrition, including while pregnant and nursing. An educated woman's household is more likely to prosper as a result of a higher overall income. So, we can actually say that: invest in women and girls, and the benefits flow not only to them but everyone around them, too (Gillard&Blanchett 2014).

We also have the history of the Prophet's wives who were intelligent women. Not only they had a high learning spirit but they were also willing to teach what they understood to other companions of the Prophet. Moreover, the story of shahabats of the Prophet teaches us that there is no difference in the right to study and to teach between men and women. The ladies are also encouraged to go to knowledge gatherings, both

general (all men and women might study the subject) and specialized knowledge (which is needed for women, such as women's blood). Realizing the important role of education for a woman, this paper aims to discuss the role of education of women in supporting the economy in the family.

Materials and Methods

The research used qualitative method and the approach used by the author is the grounded theory approach, which is to build theories from data. Grounded theory focuses more on building theories from data. Qualitative research is often called natural rather than scientific research. However, the procedures and results remain a work process and the results of scientific work, as long as they meet the three main criteria: rational, empirical, and systematic (Dede Rosyada, 2020). The purpose of grounded theory is data theorization. Theorization is an action or interaction-oriented method of theory building, therefore suitable for behavioural and social research. The result of the data collection process is a theory. Respondents in this study were determined by purposive sampling technique, which is sampling with predetermined criteria. The respondents were all consent to fill out the questionnaire given by the author online via google form. There were twenty five respondents participated in this mini research.

The target respondents are adult women who are married and have at least a bachelor's degree, some work in offices, some work from home or have their own business and some do not work. All respondents are full-time housewives and receive full support from their husbands, whether they work in an office or not. The research was conducted by distributing limited questionnaires to the author's friends and processing the data by adding literature studies from previous research and supporting books. The research was conducted for two weeks, around the second week and third week of June 2023 in Jakarta. The analysis of the result was cross-referenced with the literature studies that had been done previously to validate

the theories compiled by the author. The list of questions includes:

Table 1.

Question summary by google form

Questions
1. What's your level of Education and major?
2. What's the benefits of schooling for you?
3. What's your Activity now (working or not working)?
4. What's the benefits of your level of education in your carrier?
5. What's the benefits of your level of education in your household?
6. Do you think your level of education support your role as a wife and a mother?
7. What's the benefits of education to support your husband's carrier
8. Are you interested in continuing your education to a higher level?
9. What's the most significant change in your household should you not have the level of education that you have now?
10. In what aspect that your husband is grateful for your level of education?

Results and Discussion

The Summary Result of The Questionnaires

All respondents were married women with children. 21 respondents held bachelor degree, 3 held master degree and 1 had doctoral degree; 9 of the respondents worked as a full-timer at the office, 2 worked part-time, 4 ran a home-based business, 10 of them did not work. About fifty percent of the respondents felt the need of getting the next level of schooling but they had difficulties in time managements and leaving the house or work for school, while others didn't. Those who did not want to go back to school thought that their biggest difficulties were time management, insufficient finance, small children at home and motivation to be a student at relatively old age. They did not want to continue their school because they also thought that they have had enough level of schooling that was beneficial for their recent lives. Only one of the 25 respondents managed to get to the highest level of schooling which was doctoral degree because she thought it was needed in her line of work or in the future carrier.

All respondents thought that their level of education was beneficial whether they worked at the office or at home (as a businesswoman or a housewife). Some of the benefits felt by respondents with their last level of education were: learning critical thinking and how to solve problems sequentially, making their parents-who have sent them to school- happy and satisfied , being able to be a partner for their husbands in term of discussion and daily conversation, preparing themselves as wives and mothers from the beginning of marriage-pregnancy-childbirth and educating children, being able to manage household finance better, learning to control

emotions especially when interacting with other humans, getting a more respected position in the environment because of education and being able to make essential decisions for the family. The respondents agreed on how their husbands were grateful to have an educated wife because: the wives were more patient and had brilliant ideas to solve the family problems, they could manage the money well, they finished the household chores effectively and on time, they knew how to handle their family's health, they could help the children study at home, and they had the desire to keep learning in any ways possible. A husband, knowing that things are managed well at home, can go to work with a peace of mind. They are taken good care by their wives, their health as well as their food and clothes were well-maintained. An educated wife makes sure her husband goes to work properly and happily and she can also be a proper discussion buddy for her husband to whom he can share thoughts, exchange ideas, and ask for her opinion on things or even make major work-related decisions. Whether she works at the office or not, an educated wife is beneficial as an equal partner to understand her husband at the same level of knowledge and understanding. Having this kind of wife by his side can boost a man's performance at work and eventually effect on his career advancement.

The respondents who worked at the office felt that they had contributed greatly to the family economy because they provided double income in the household. The wife's income could be used to support primary daily needs or to meet tertiary household needs such as entertainment, vacations, additional needs for her children (eating out, social costs for her children at school, etc.) and her own personal needs (skin care, make up, bags, clothes, etc.). Working wives tend not to be stingy with themselves nor with their families so that they can reward themselves the pleasure they want within the limits they have calculated. Wives who can provide pleasure for themselves tend to be happier in living their daily lives and carrying out their roles as a wife and a mother.

All respondents believed that since education shapes someone's thinking patterns, thus highly educated wives tend to be preferred by highly educated man because they are considered as having a similar way of thinking and being an equal soulmate, in terms of domestic management, childcare, healthcare and even family financial management

Discussion

The Importance of Education for Women

According to SISDIKNAS Law No.20 of 2003, education is a conscious and planned effort to create a learning atmosphere and learning process so that students actively develop their potential to have religious spiritual strength, self-control, personality, intelligence, noble character, and skills needed by themselves and society. Education is an effort that is intentionally chosen to influence and help children with the aim of improving knowledge, body and morals so that it can slowly lead children to their highest goals and ideals. So that the child has a happy life and what he does can benefit himself, society, nation, state and religion (Undang-Undang Republik Indonesia Nomor 20 Tahun 2003 Tentang Sistem Pendidikan Nasional 2003).

Education is an effort in developing knowledge, skills, forming a strong personality in facing various kinds of problems both in the world of education and everyday life. It plays an important role in determining the nature and fate, not only of an individual but also of the society and the country. Education is needed to pass on a cultural inheritance from one generation to another. It should be manifested with a learning atmosphere and learning process so that students actively develop their potential to have religious spiritual strength, self-control, personality, intelligence, noble character, and skills needed by themselves and society. According to H. Horne, education is a continuous and eternal process of higher adjustment for human beings who have developed physically and mentally, who are free and conscious of God, as in the intellectual, emotional, and humanitarian surroundings of humans (Abd Rahman BP 2022; Nurkholis 2013; PGSD PGRI University Yogyakarta, n.d.).

Education is as important for women as it is for men. One of the criterias of a true Muslimah is to have knowledge that can be taught to her children and for the benefit of society. To put this into reality, women must be given the same right to education as men. Islam does not discriminate against women in studying. As Rasulullah SAW said:

"Demanding knowledge is the duty of every Muslim and Muslimah" (HR. Al Tabrani through Ibn Mas'ud)

A woman, must have the trait of intelligence (fathaanah). Fathaanah means an intelligence, skill, or mastery of certain fields including intellectual, emotional, and spiritual. Fathaanah means wisdom and to become a problem solver. In addition, the fathaanah characters could also be elucidated in several points, there are: having the ability to adapt regard to the development and the changing items; having superior competence, quality, and competitiveness; and having intellectual, emotional, and spiritual intelligence (Chanifah 2021). Before marriage, she is the child of her parents. Later if she gets married, then she will be responsible for her household and family. If she is not married, then she will be responsible for herself as a mukallaf adult. Sheikh Muhammad Nawawi Al Bantani formulated mukallaf as: a person who has reached baligh (adulthood) and has a mind, with which he has the ability to know the functions and functions, and with that knowledge he is able to do taklif-taklif syar'iiyyah. (Tihami 1998) As mother to be, a woman must prepare herself not only to be a mukallaf but also to educate her children in the future to be able to become a mukallaf, too.

A woman must also be beneficial to others, because the Prophet said: "The best of mankind is the most beneficial to mankind" (HR. Ahmad). So the best woman is the one who benefits others the most. History tells us that a highly educated woman will be more beneficial than an uneducated woman. We know the story of Aisyah RA's who memori thousands of hadith. Al-Hafidz Adz-Dzahabi in his book Siyar A'lam An-Nubala', said:

وَلَا أَظُنُّ فِي أُمَّةٍ مُّحَمَّدٌ -صَلَّى اللهُ عَلَيْهِ وَسَلَّمَ- بَلَّ وَلَا فِي النِّسَاءِ مُطْلَقًا امْرَأَةً أَظُنُّ مِنْهَا

"I do not know of any woman in the Ummah of Muhammad (peace and blessings of Allaah be upon him) who is more knowledgeable than 'Aisha."

مُسْنَدُ عَائِشَةَ: بَلَّغَ الْفَقِيهُ وَمُسْنَدُ وَاعِظَةٍ وَأَرْبَعَةٌ وَسِتُّونَ حَدِيثًا وَالْفَرْدُ الْبُخَارِيُّ بِأَرْبَعَةٍ وَخَمْسِينَ وَالْفَرْدُ مُسْنَدُ نَيْسَابُورِيِّ

From a quantitative point of view, the number of hadith memorized by Abu Hurairah is more than Sayidah Aisha, more than 5,000 hadith memorized by Abu Hurairah, but in terms of delivery Sayidah Aisha is better (Muhsin & Inah, 2014).

Past Research on The Benefits of High Education for Women

Several journals have described previous research on the relationship between a woman's education and its benefits for herself and her family. As a mother, an educated woman is more concerned about exclusive breastfeeding for her baby which will have an impact on the baby's health and intelligence in the future. Educated mothers also pay more attention to the growth and development of their children in the golden period (ages 3-5 years) so that they can optimize their brain growth and the health of the child (Farida et al., 2022; Hidayah & Adini, 2016). Leah Witcher Jackson, The Vice Dean of the Law School at Baylor University School of Law, stated that the world needs to focus on women's education to fight poverty and to achieve global economic growth and development and social development, because women's education turns out to be the best investment for a country to grow and develop for the better (Jackson, 2006).

Another study conducted in Australia and took data from HILDA: The Household, Income And Labor Dynamics In Australia, states that higher levels of education in women lead to higher levels of *eudaimonic* well-being, hedonic well-being, positive affect, and reduced psychological distress, highlighting the non-monetary benefits of education. *Eudaimonic* comes from the Greek *daimon*, which means self. *Eudaimonic* happiness means that happiness is the result of the struggle to achieve self-actualization,

which in the process will be greatly influenced by the talents, values, and needs of individuals in living life (Baumgardner, 2010). Therefore, policymakers should continue to promote education widely, so that women can achieve higher levels of well-being in the future. In addition, findings show that the relationship between education and well-being is mediated by healthy behaviors, such as engaging in physical activity, abstaining from drinking and smoking, social interactivity, and higher income. Therefore, public health campaigns that promote healthy behaviors among women have the potential to reduce the formal education gap (Tran et al., 2021).

From the Middle East, the world noted the figure of Fathima Al Fithriyah who founded the Al Qawariyyin mosque in Morocco in 857-859. She was a person who contributed greatly to the field of education and was one of the few people who worked for the emancipation of society in general and the improvement of the status of women in particular. Later in the 19th century in West Africa, there was Nana Asma'u, the daughter of Shehu Usman and Fodio who was a prominent female Islamic scholar, poet, teacher, and a very genius Muslim woman writer who had written more than 60 books. Her brother, who was a Khalifah, used to respect her advice in administrative matters because of her intellectual capacity. She also kept records of written instructions, discussed and engaged in official discourse with foreign delegates and scholars. Highly educated in classical Arabic, mastering four languages, Arabic, Fula, Hausa and Tuareg; Asma'u was not only respected as a Nigerian scholar today, but also regarded as a pioneer of modern feminism in Africa and as the epitome of the independent woman under Islam. In more than 60 literary works written over more than 40 years, Nana Asma'u left behind a large number of poems in Arabic. Like most members of her family, she became a prolific writer. She created nearly 1830 female cadres as an educational project that began to integrate poor and rural women, training teachers, called *jajiss*, who travelled throughout the Khalifah era to educate women in the homes of students. Each of these

jajiss used the writings of Nana Asma'u and other Sufi scholars through memorization and poetry to train a group of educated women. Recent republications and translations of her works have brought so much attention to the pure literary value of her prose and poetry. Nana Asma'u has become a subject of several studies in the modern era of the 21st century (Nazli, 2022).

The pandemic period that we have just passed over the past two years has provided a new perspective on education for women. A journal written by Astrid and friends from IAIN Bone about the opportunities and challenges of child education in the pandemic era for career women concluded that the pandemic provides working mothers with more opportunities to spend more time with children at home and thus provides good emotional intimacy between mother and child. The mother's time management is also more flexible as work can be done from home. The result of more time spent together gives the mother the opportunity to assist the child in learning including through social media which seems more appealing to children. However, there are also challenges in addition to these opportunities, namely that children tend to be less obedient when directed by their parents than when directed by their teachers, mothers are also required to spend quite a lot of time teaching their children and there is a dependency of children in the use of technology (Niar et al., 2023).

Discussion From The Results Of The Questionnaire

The result of the research confirms the theory that a woman needs education to help her become a wife and a mother in her home. She can be a good manager to handle her chores at home: she looks after the health of family members, takes care of children's education, and makes sure all the affairs that took place in her house went smoothly. She knows how to treat and educate her children even since before they were born. She takes good care of her husband and makes a good partner for him to talk to and to discuss things at home and at work. In terms of economy, an educated woman helps her husband in some ways, from giving her husband a peace of mind when he goes to work, to being the second bread-winner or even the main

bread-winner in the house (for some cases). An educated woman is an effective mom that manages the household finances and balances the family cashflow. A highly educated man prefers to look for an educated wife to be an equal partner in household.

Education is important and needed by a woman as much as it is needed by a man, whether she works fulltime at the office or as part-timer or becomes a housewife. The prophet said,

خَيْرُ النَّاسِ أَفْعَلُهُمُ لِلنَّاسِ

Meaning: "the best of people are those who are most beneficial to people." (hr. Ahmad).

As servants of Allah, women must also strive to be the best human beings, it means they need to be beneficial to others. And one way to become beneficial to others is through education. A woman, whether as a wife, a mother, or as herself, will become a more useful human being by pursuing higher education. She can achieve the quality of being a better person with education, one of which is being Fathaanaah, that means an intelligent and wise woman who can be a problem solver in her environment.

A wife and mother, whether she works or does not work in an office, still needs a high education to support her success in educating children. As the mother is usually the centre and manager of a household, her education will really help her in fulfilling her duties well. She can be a problem solver along with her husband for every issues that might come up at home. And in terms of economic value, a highly educated woman will provide more economic benefits for her family. It is undeniable that if the economy of a family is in a good position, then the level of happiness and family harmony are also relatively better maintained and can be achieved. Of course, the religious values and religiosity of a married couple in addressing economic stability also affect the level of family happiness.

There are several reasons why a woman must pursue higher education and become an intelligent human being:

1. Mother is the first madrasah for her children. A smart and highly educated woman will later be a

mother and she will likely give birth to smarter children because she knows how to treat and educate them since they are still in her womb. Highly educated women even prepare their children's education since before marriage, one of which is by looking for a husband who is suited to be a good and responsible father for their children. So, an educated woman builds stronger and more planned family including in terms of its economic plans in the future.

2. Highly educated wives are more able to manage their households in a more orderly and organized manner, she knows how to handle family income to fulfill all the family needs, she can manage time better so each member of the family can do their daily activities comfortably. A mom usually is the one who makes plan and arranges everything at home, the children's education plan, the family's health insurance, the daily menu for family meals, the holiday plan, et cetera. The good arrangement of the household will eventually affect the family economy plan, so an educated woman makes a more effective mom for family economy.

3. Higher education expands women's knowledge and heightens the rationality of their thinking. This enables women as wives, mothers, or on their own to take more rational steps in acting or making decisions. An educated wife can also be a comfortable discussion partner for her husband and can provide views for decisions that the husband should make, whether at home or at work. Thus a higher education of mom will ensure the ongoing improvement for the whole family.

Conclusions

The result of the research confirms the theory that a woman needs education to help her become a wife and a mother in her home. She can be a good manager to handle her chores at home; she looks after the health of family members, takes care of children's education, and makes sure all the affairs that took place in her house went smoothly. She knows how to treat and educate her children even since before they were born. She takes good care of her husband and makes a good partner for him to talk to and to discuss things at home and at work. In

terms of economy, an educated woman helps her husband in some ways, from giving her husband a peace of mind when he goes to work, to being the second bread-winner or even the main bread-winner in the house (for some cases). An educated woman is an effective.

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Anti-Abstention Pesantren: Salafiah Pesantren Ideology and The Efforts of Muara Enim General Election Commissions to Increase Voters Participation

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Abstract: The purpose of this research is to find out the reasons or ideology of Pondok Pesantren Dhiya'us Salaf and the people of Karang Agung village, Lubai Ulu sub-district, Muara Enim, South Sumatra who refuse to participate in the general election and what efforts have been done by the general election commission of Muara Enim and South Sumatera. To achieve these objectives, this research was conducted by using qualitative methods in the form of empirical sociological approaches. The techniques used in data collection were observation, interviews, and forum group discussions with the chairman and commissioners of the general election commission of Muara Enim and South Sumatra, voting committee, district election committee, head of Lubai Ulu sub-district, head of Karang Agung village, administrators of Pondok Pesantren Dhiya'us Salaf, and other involved communities. The results of this research shows that the management and the community of Pondok Pesantren Dhiya'us Salaf did not want to contribute their votes in the elections because of some reasons: (1) avoiding disunity, (2) there are no sanctions in both state law and religious law, (3) ideology of western election, and (4) focusing on their field of religion. On the other hand, the general election commission of Muara Enim and South Sumatra did some efforts to increase voters' participation by: (1) providing general election socialization and voters' education without focusing on Pondok Pesantren Dhiya'us Salaf, (2) registering Pondok Pesantren Dhiya'us Salaf residents in the permanent voter list, and (3) devoting the polling stations.

Keywords: Participation, Election, Pesantren

Introduction

General election is a sacred activity run to affect greatly the course of government and development in a country (Sucipto, 2019). states that successful election is seen from the level of participation, the higher the level of participation, the higher quantity and quality will it become (Conover M.D et al, 2011). In line with the increasing level of participation in elections, several factors affecting the participation rate must also be considered (Caprara, G. V., et al, 2006). According to (Warganegara et al, 2019), the factors in question are: 1) awareness of political rights, 2) assessment of government policies, 3) even social status can also affect the level of participation.

To anticipate these factors, socialization and education for voters play an important role as efforts to increase electoral participation (Harnom et al., 2019). Based on an article 22 E Paragraph (5) of the 1945 Constitution, it is explained that the institution that carries out socialization and education for voters belong to general election commission (Prasetyo, 2019). General election commission is tasked with implementing and evaluating previous elections so that the electoral dynamics will continue to increase. This is evident through National Medium-Term Development Plan in 2019 which set the target of achieving national voters' participation at 77%. However, based on the data released by general election commission in 2019 that the participation rate was

77.8%. The data reveal that the national voter's participation target has been successfully exceeded by the general election commission (South Sumatra KPU, 2022). When viewed from the increase in participation, it can be believed that the general election commission's task has been successfully carried out even though there are still many people out there who do not participate in elections.

This phenomenon occurred in the Karang Agung Village, Lubai Ulu Sub-district, Muara Enim, South Sumatra, Indonesia where Dhiya'us Salaf is located which claims to be Salafiah. Based on preliminary information, it is known that the teaching conveyed to students and the community is to refuse the election participation. They argue that election comes from western ideology which is heresy. Interestingly, the general election commission of Muara Enim has recorded the participation rate in the Karang Agung Village since the 2004 election to the last election in 2019 at 0% (Daulai, et al., 2020). Therefore, this research was conducted in order to explain and analyze more deeply the ideology of Pondok Pesantren Dhiya'us Salaf and the efforts done by the general election commission of Muara Enim against this phenomenon with the title "*Anti-Abstention Pesantren: Salafiah Pesantren Ideology And The Efforts Of Muara Enim General Election Commissions To Increase Voters Participation*".

Based on the above background, the problems formulated in this study are "How is the Ideology of Pondok Pesantren Dhiya'us Salaf Pesantren and what efforts are done by the general election commissions of Muara Enim in increasing voters' participation?". Consequently, the research objectives are obtained to know and describe the ideology of Pondok Pesantren Dhiya'us Salaf and the general election commissions of Muara Enim's efforts in increasing voters' participation. It is finally hoped that this research will generate academic, theoretical, and practical benefits. Academic theoretical benefits refer to enriching insight related to elections, including socialization and voter education, especially among potential students to be voters. Practically, it is expected to present a solution for breaking the chain of abstention that occurs in Pondok Pesantren Dhiya'us Salaf and the involved communities

which can become a material reference for the general election commissions of Muara Enim to formulate the right pattern of socialization and voters' education for Pondok Pesantren Dhiya'us Salaf along with its involved communities.

The phenomenon of abstention in Pondok Pesantren Dhiya'us Salaf is contrary to democratic, participative, and inclusive election theories. Based on the theory of democracy popularized by JJ. Rousseau that election is an important indicator in a country for a democratic system. This is clearly not in line with the non-voting behavior carried out by Pondok Pesantren Dhiya'us Salaf because the behavior of not participating in election will not be fulfilled (Djuwita, 2019). Meanwhile, when viewed from the participative theory expressed by Rousseau that the quality of democracy is largely determined by the quality of participation and democracy without participation is not democracy (Bermeo, N. ,2016). It is obviously contrary to Pondok Pesantren Dhiya'us Salaf which does not want to participate in the election (Thalhah, 2009). Even more emphasized through HAR. Tilaar on Inclusive Election Theory if, what is meant by inclusive election is an election that provides the widest possible participation opportunity to every citizen, while the students and administrators of the Pondok Pesantren and even the surrounding residents do not want to participate in the election on religious grounds. Therefore, election called inclusiveness will never be realized (Ferdinand, 2010).

Materials and Methods

Study area

1. Research Methods

The research method used in this research was qualitative research in the form of case study approach to explore more deeply about the case of low participation in Pondok Pesantren Dhiya'us Salaf in Muara Enim, South Sumatera, Indonesia (Syarbaini, 2018). In line with this, descriptive analytical research was used to describe detailed data collected in the field (Rachman, 2018).

2. Data Source

The data sources used in this research were from Pondok Pesantren Dhiya'us Salaf with six chosen informants to represent the entire population of this study. The various factors referred to include the following:

- A. The provincial commissioner of South Sumatra in the division of planning data and legal division for the organizational structure of organizing elections.
- B. The chairman and commissioners of the community participation division of Muara Enim, as the leading sector for organizing elections in Muara Enim.
- C. The public relations of Pondok Pesantren Dhiya'us Salaf because it has the qualifications to represent the Pesantren's academic community.
- D. The chairman of Lubai Ulu's regional general election commission, technical organization of elections at the level of sub-district
- E. The Chairman of Karang Agung's voting committee, technical organization of elections at the level of village.
- F. The village secretary of Karang Agung, the person in charge of government at the village level.

Procedures

Pre-research is an activity carried out before research is carried out in the field, such as: 1) Submitting a research permit letter to the South Sumatra Province KPU and Muara Enim Regency KPU, Dhiya'us Salaf Islamic Boarding School, Lubai Ulu PPK, Karang Agung PPS and the village government Great Coral. 2) Attach consent to the willingness to conduct interviews and Focus Group Discussions with each research informant (Informed Consent). 3) Conduct observations to determine competent informants and the number of informants who can meet the data requirements in the research (Herdayati and Syahrial, 2019). 4) Prepare several main questions in the semi-structured interview and Focus Group Discussion stages which will later be developed more intensely and exploratively during the interview and Focus Group Discussion activities where you meet directly with the informant (Herdayati and

Syahrial, 2019). Pre-research activities are carried out to prepare various needs needed during direct research in the field. The next activity is the stage of data collection based on qualitative research methods with a case study approach, namely through semi-structured interviews and Group Discussion Forums with the South Sumatra Province KPU, Muara Enim Regency KPU, Dhiya'us Salaf Islamic Boarding School, PPS, PPK and the Karang Village government Great. The 2 series of research activities above were carried out by receiving direct support and assistance from the KPU of South Sumatra Province through letter number: 408/HK.05 - SD/16/2023 dated 7 June 2023 with the subject: research permit.

Data analysis

The data analysis technique referred to the concept (Miles et al., 2014), through 4 stages of analysis, namely:

- A. Data Collection. Collecting as much research data as possible using data collection techniques, observation and semi-structured interviews and Focus Group Discussions (FGDs).
- B. Data Condensation. The summarized data were reviewed by looking for patterns and selecting the focus.
- C. Data Presentation. Furthermore, the data from observations, interviews and Focus Group Discussion (FGD) reduced by being presented in the form of narrative text, and at this stage the results were interpreted to match the formulation.
- D. Conclusions. After collecting, reducing, and presenting, the conclusion was a further analysis to make conclusions according to the data and facts found.

The data obtained were then tested for validity by means of 2 types of triangulation, including the following: 1) Source of triangulation. Comparing six data sources namely interviews from the provincial general election commissions of South Sumatra, the general election commissions of Muara Enim, the voting committee, the regional election commission of sub-district, the village secretary, and the public relations of Pondok Pesantren Dhiya us'Salaf to check and saturate the data, 2) Tringulation Method. The results of

observations, interviews and FGD were seen for the correlation and relationship of each obtained data (Sugiyono, 2017).

Then the data were further strengthened by member-checking, namely going back to the informant after the data is analyzed to find out whether the resulted data were valid or not proved with the informants' signature as stated in the attachment for reliable data (Kuncoro, 2013).

Results and Discussion

Results

1. Socialization and voter education of Muara Enim's general election commissions at Pondok Pesantren Dhiya'us Salaf.

The general election commissions of Muara Enim at first learned that there was a phenomenon of abstention in Pondok Pesantren Dhiya'us Salaf during the election of the regent and deputy regent of Muara Enim in 2013. The interesting phenomenon began and ended with empty votes in 1 polling station where all the voters consisted of residents and students of Pondok Pesantren Dhiya'us Salaf. After that, the general election commissions of South Sumatra and Muara Enim immediately took swift steps by going directly to the field to verify the validity of the information and conducting direct discussions with the Government, National and Political Unity, Attorney, Dandim, Sub-District Head, and Village Head to obtain data about why all voters of Pondok Pesantren Dhiya'us Salaf do not use their voting rights on the grounds of belief (Chairman of general election commissions of Muara Enim: July 07, 2023).

After the accident of local leaders election in 2013 until now, the general election commissions of Muara Enim has never conducted socialization and voter education including to Pondok Pesantren Dhiya'us Salaf because of the budget constraints. It happens because the absence of election participation choice of the islamic boarding school has involved beliefs so that it is not the domain of the Muara Enim's general election commissions but the government (Chairman of general election commissions of Muara Enim: 07 July 2023).

However, based on the information obtained that the government and the ranks of the regency had a direct dialogue with Pondok Pesantren Dhiya'us Salaf regarding abstention, but the activity did not involve the general election commissions of Muara Enim.

To maintain the stability of elections in Muara Enim, in the 2018 and 2019 regional elections, voters from Pondok Pesantren Dhiya'us Salaf were split and put into different polling stations, but still within the scope of the Karang Agung Village polling station so as to avoid polling stations with 0% participation (Coordinator of the Community Participation Division of general election commissions in Muara Enim: July 7, 2023). However, based on the mentoring of polling station officers in the field of Pondok Pesantren Dhiya'us Slaf, until now they still do not use their voting rights (Chairman of Karang Agung's voting committee: July 10, 2023).

Although the voting committee of Lubai Ulu Subdistrict and the voting committee of Karang Agung Village have conducted socialization in several times along with the general election commissions of Muara Enim and governmental parties such as National and Political Unity, the sub-district party and the village head which have appealed to use their voting rights to the islamic boarding school as well as the Regent has also sent his team to discuss with the board of the islamic boarding school, but until now there has not been any change to Pondok Pesantren Dhiya'us Salaf (Kordiv. Hukum KPU Muara Enim: July 7, 2023). As for so far, the approach taken is persuasive family because the boarding school management is quite open to the community, especially the implementation of elections, even when collecting the Permanent Voters List (DPT) and other electoral activities they actively participate, but not when faced with exercising their voting rights (Chairman of voting committee of Lubai Ulu).

The provincial general election commissions of South Sumatra as the coordinator of the Election Implementation at the provincial level of South Sumatra has also played its role. The provincial general election commissions has instructed the Muara Enim's general election commissions to be able to pay special attention to the participation in

Pondok Pesantren Dhiya'us Salaf, then also appealed to be able to involve all interested parties including National and Politic Unity, MUI, and Police. The provincial general election commissions of South Sumatra has also identified the same group. The result is that until now there is no similar community found. In general, the various instruments of socialization and political education that become the program of general election commissions of South Sumatera cannot run in parallel because of the limited budget (Kordiv Planning, Data and Information KPU of South Sumatera).

2. Pondok Pesantren Dhiya'ussalaf's views on elections and democracy.

In principle, Pondok Pesantren Dhiya'us Salaf loves the Unitary State of the Republic of Indonesia and recognizes Pancasila and the 1945 Constitution as the basis and constitution of the Republic of Indonesia. However, it is inversely proportional to the field of politics and muamalah, the Islamic Boarding School taklik with the decree of Allah in the Qur'an and the Sunnah of Rosulullah SAW with the role model for its implementation is the period of companions, tabi'tabi'in who are the best generation of salaf scholars of Islam. Regarding the use of voting rights in elections, the Islamic Boarding School admits that it has never taught or instructed or even appealed to students and residents of the Dhiya'us Salaf environment to abstain from voting. However, the ideology of not voting is born from the awareness of each individual (PR Ponpes: July 9, 2023). As for if a polling station is established, Pondok Pesantren Dhiya'us Salaf welcomes it well even though they are not willing to be officers or vote (Karang Agung's voting committee: July 10, 2023).

From the results of the Focus Group Discussion (FGD) on July 10, 2023 with teachers and lecturers of Pondok Pesantren Dhiya'us Salaf, four foundations were obtained which became the basis for the consideration of Pondok Pesantren Dhiya'us Salaf not to use their voting rights, namely:

A. Not exercising the right to vote in elections is the free choice of every citizen because choosing not to vote is also a choice, and there are no legal or religious sanctions.

B. The election can also give birth to various negative impacts in the form of division which so far 625 heads of families in the Pondok Pesantren Dhiya'us Salaf complex live in harmony, compact and peaceful. It is feared that if they actively participate in the election, the residents of the cottage will then be divided according to their respective colors and choices and will certainly result in the erosion of the integrity and sustainability of the cottage. Plus, especially if the elected leader is a leader who brings damage, then we must also take responsibility for delivering a despotic ruler to control our nation.

C. Democracy and election are not ways of appointing or choosing leaders as taught by the Qur'an and the Sunnah of the Prophet Muhammad PBUH and no examples were found during the time of the companions and the Tabi'in. Then, if choosing and appointing leaders are in accordance with the guidance of the Qur'an and Sunnah, Pondok Pesantren Dhiya'us Salaf will then follow it.

D. Dhiya'us Salaf focuses more on worship and religious education as their field of expertise. While in matters of nation and state, the residents and administrators of the Islamic Boarding School are sami'na wa atho'na to the decision of the official state leader.

However, if there is a possibility that the residents, students, and administrators of the islamic boarding school run for the position of people's representatives or leaders. The answer is then unlikely to happen because: first, it is contrary to the vision of Pondok Pesantren Dhiya'us Salaf, second, Pondok Pesantren Dhiya'us Salaf does not educate people who go into politics (Ponpes Public Relations: July 9, 2023).

Discussion

1. Efforts to increase voter participation made by the general election commission of Muara Enim towards Pondok Pesantren Salafiah Dhiya'us Salaf.

Normatively, the efforts to increase participation in general carried out by the general election commission and its staff are divided into two main models, namely in the form of socialization and voter education or what is often called political

education. There are several activities that have been carried out by the ranks of the provincial general election commission of South Sumatra, general election commission of Muara Enim, commitment-making officer of Lubai Ulu District, and voting committee of Karang Agung as well as the Government of Muara Enim, Lubai Ulu District and Karang Agung Village at Pondok Pesantren Dhiya'us Salaf categorized as socialization and political education activities, among others:

- A. The provincial general election commission of South Sumatra made a visit to the Dhiya'us Salaf along with instructing the general election commission of Muara Enim and its staff to solve the election participation abstention that occurs.
- B. Discussion conducted by general election commission of Muara Enim at Pondok Pesantren Dhiya'us Salaf and efforts to encourage the Lubai Ulu's commitment-maker officer and voting committee to conduct a political education at Pondok Pesantren Dhiya'us Salaf.
- C. Registering the residents of Pondok Pesantren Dhiya'us Salaf complex in the permanent voters list.
- D. Involving the management and residents of Pondok Pesantren Dhiya'us Salaf in every socialization and political education activity carried out by Lubai Ulu's commitment-maker officer and Karang Agung's voting committee.
- E. The gathering and awareness carried out by the National and Political Unity and the ranks of the Muara Enim's Government to the Dhiya'us Salaf.
- F. Continuous appeals are made by the government Karang Agung Village to the santri administrators and residents of Pondok Pesantren Dhiya'us Salaf to exercise their voting rights in the elections.

The strategy of separating 1200 voters in Pesantren Dhiya'us Salaf into 22 polling stations spread throughout the village of Karang Agung means will mingle with voters from outside their community a strategy that is quite telling, firstly, this strategy is intended so that there are no more polling stations with 0% voter participation, secondly, this strategy can also be used as a lure for

being interested in participation and using voting rights for Dhiya'us Salaf residents.

2. Factors that influence the interest of Salafiah groups at Pondok Pesantren Dhiya'us Salaf to participate in elections.

Through a simple approach or logic, it can be formulated that the factors that influence interest are the antithesis of the things that underlie their reluctance to participate. It was revealed from the focus group discussions and interviews conducted with Ustadz Abu Syafiq on July 10, 2023, that the background of thought so that the Pesantren Dhiya'us Salaf community did not use their voting rights in the elections were as follows:

- A. There are no sanctions either by state law or religious law for those who do not exercise their right to vote in elections. However, this idea contradicts to theory of democracy.
- B. In order to avoid divisions among fellow of Pondok Pesantren Dhiya'us Salaf communities due to differences in political choices in elections. Therefore, the role of political education as intended by (Dudih, 2019) is very necessary.
- C. Elections and democracy are western products and tend to deviate from the Sunnah. In fact, in the science of Fiqh Siyasah, there are various Qur'anic and hadith arguments that clarify the nature of elections and democracy from an Islamic perspective.
- D. Pondok Pesantren Dhiya'us Salaf prefers to focus on worship and religious education as its expertise. As for the affairs of the nation and state, the residents and administrators of Pondok Pesantren Dhiya'us Salaf are sami'na wa atho'na to the decision of the official state leader. So, the question arises if the leader is a person who will bring ruin to the nation and religion whether the Dhiya'us Salaf is just silent about it.

Through the antithesis approach, we can formulate the factors that can influence the interest of the Salafiah community, especially Pondok Pesantren Dhiya'us Salaf, in exercising the right to vote and participating in elections, as follows:

- a. There is a law that states explicitly for people who do not want to use their voting rights, or a

fatwa of MUI which states that abstention is a sinful act.

- b. If you can ensure that holding elections cannot only create divisions but also become a means of national integration.
- c. An in-depth study of fiqh siyassah in relation to elections and democracy is conducted.
- d. That building and improving the nation is part of worship and jihad in Islam because we are commanded to fight every form of evil, elections should be an evaluation arena for leaders.

Conclusions

1. In principle, Pondok Pesantren Dhiya'us Salaf recognizes and loves the Unitary State of the Republic of Indonesia including Pancasila and the 1945 Constitution. Regarding the right to vote, Pondok Pesantren Dhiya'us Salaf has never instructed or taught or even appealed not to use the right to vote. The various reasons that become the basis of their thinking not to vote, namely: (1) avoiding divisions, (2) there are no sanctions in both state law and religious law, (3) ideology of western election, and (4) focusing more on worship.
2. In particular, the general election commission have not planned and programmed activities on socialization and political education activities specifically for increasing voters' participation in the Salafiah group at Pondok Pesantren Dhiya'us Salaf. Socialization carried out so far is also only partial and reactive in accordance with the stages of organizing elections or elections. The political education carried out tends to be budget-based and does not involve multi stakeholders. Concluding sentence should be given after the discussion.

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Comparative Study of Islamic Inheritance Law with Customary Inheritance Law in Kotaagung District Tanggamus District, Lampung Province

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Abstract: Inheritance law is the law governing inheritance. Islamic law only recognizes individual inheritance systems while customary law recognizes collective, individual and mayoral systems. The Kotaagung community adheres to a male mayoral system, in which the eldest son is the sole heir who gets all the inheritance from the heir. This is different from Islamic inheritance law, every time someone in an Islamic family dies, there is always the issue of dividing the inheritance. This type of research is field research, research conducted by going directly to the field. Methods of data collection using the method of observation, interviews and documentation. The results of the study obtained that the inheritance practices of the Kotaagung community in their distribution still apply the applicable customary law, namely the heir is the oldest son, but now some people have abandoned this due to the mixing of customs and culture, marriage, and the reluctance of some of their descendants to use the law. the custom. The similarities and differences are that they have pillars and the same distribution process, the distribution of assets under Islamic inheritance law is clear and detailed, while customary inheritance law uses a single heir, namely the oldest son, and settlement of customary inheritance law disputes uses the kinship and deliberation system while inheritance law Islam refers to the basis and source of Islamic inheritance.

Keywords: Islamic inheritance, customary inheritance, mayor, Kotaagung.

Introduction

Islamic inheritance law occupies a very important place and has been explained in detail in the verses of the Qur'an. This is because the issue of inheritance is experienced by every Muslim family. Inheritance law discusses the division of property that is not given definite provisions by the testator, so it is easy to cause disputes and problems in the division of inheritance. The issue of inheritance in Islam includes three things, namely who is entitled to receive, the amount of inheritance given, and how to distribute the inheritance. These three aspects are regulated in Islamic inheritance law.

Inheritance law is an implication of marriage law that determines and reflects the form of law that applies in that society. Allah swt has regulated

and stipulated the provisions regarding inheritance in His word Surah An-nisa' verse 11. These provisions become guidelines for Islamic families in dividing inheritance, inheritance law views the position of men and women as equal as heirs. The difference between the two lies in the portion or amount of inheritance received.

The Compilation of Islamic Law also determines this in Article 176 to Article 182. KHI determines that a sister gets half of a son's share and even the portion of widows and widowers in inheritance rights is also different. In a case of inheritance if the testator has children then a widow gets an inheritance of 1/8 (one-eighth) and if the testator has no children then the widow gets 1/4 (one-quarter). Furthermore, the share of inheritance for a widower gets 1/4 (a quarter) if the testator has

children but if the testator does not have a child then the widower gets an inheritance of $\frac{1}{2}$ (half).

Islamic inheritance law also regulates the rights and obligations that must be followed and obeyed by every Muslim. The distribution of inheritance must be done fairly in order to avoid divisions between relatives in the Islamic family. Therefore, the presence of the Qur'an and Hadith which regulate in detail about inheritance ensures the welfare of Muslims. Islamic inheritance law serves to fulfill the needs of the owner of the property and establish brotherly relations among humans⁴. In practice, there are still many Muslim communities who divide inheritance property without using the provisions that have been outlined in detail according to the Qur'an. The practice of dividing inheritance that occurs in Muslim communities is still influenced by the provisions of the customs of their ancestors⁵. Customary law is a law that is not made by the government in the form of laws but its implementation and resolution in some problems are recognized by the government because there are still many cases and problems that can be resolved by customary law. Customary law is a norm formed or created in a community life that relates to human behavior. Customary law is formed through a filtering process in the customs of the community which is enforced after obtaining approval from members of the local community.

For example, customary inheritance law in Kotaagung Subdistrict, Tanggamus Regency, Lampung Province. The inheritance system in Kotaagung Sub-district is highly dependent on the customary inheritance system, and the people in Kotaagung Sub-district are more inclined to the system because it has been a habit for generations so that people still maintain the customary inheritance system rather than the Islamic inheritance system. The community of Kotaagung Subdistrict adheres to the male majorate system, where the eldest son (male descendant) is the sole heir of the testator.

The people of Kotaagung Sub-district have their own way of applying the law in relation to the inheritance system. The community of Kotaagung Subdistrict adheres to the male majorate system, where the eldest son (male descendant) is the sole heir of the testator.

Lampung customary inheritance law in Kotaagung District is very different from Islamic inheritance law. This difference can be seen in the inheritance which is the absolute right of the eldest son without any distribution to other heirs. The majorate system is often misinterpreted not only by people who do not understand it, but also by the heirs themselves. The eldest son is a substitute for the parents whose job it is to take care of the family members left behind by the testator. The majority of the people in Kotaagung Subdistrict are Muslim, but this does not stop them from maintaining this customary inheritance system that has been a custom for generations. Because what has been carried out and obeyed by the community becomes unwritten law. Based on the explanation above, the researcher is interested in examining how the practice of customary law of inheritance division in Kotaagung Subdistrict is compared with Islamic inheritance law.

Sekampung Udik District, East Lampung Regency ". In his thesis, he explained about the East Lampung community which adheres to the male majorate system and how the oldest adult son can be a substitute for parents who have died and is not an individual property owner. He is only the holder of a parental mandate who has the obligation to take care of other family members left behind, including the inheritance.

Ganira Octa Maria Amru, Iskandar Syah, Maskun, "The Division of Inheritance in Lampung Saibatin Community Who Do Not Have Male Children". This journal explains that the male majorate inheritance system allows adopting sons from relatives but may also be from outside relatives if there are none, adopting children in this case through marriage. The position of adopted children as a substitute for biological children has full responsibility to their customary parents who are responsible for all inheritance and relatives of customary people. Legal actions between husband and wife in the semanda marriage system are not balanced, although the husband appears to come out, but the wife's influence is greater than the husband. This will be seen in the wife's kinship because the husband's position is only as a successor to the offspring until he gets a son. Her position with regard to the inheritance does not

exist at all because the one who is fully entitled is the son resulting from the marriage. If the biological daughter marries "ngakuk ragah", then dies and has no sons or daughters, the status of the husband's children will be lost even though they have been appointed as customary children and are considered to have left the kinship of the wife's extended family.

As far as research is concerned, researchers have not found books that specifically discuss customary inheritance law in Kotaagung District, Tanggamus Regency, Lampung Province. Based on the literature review above, according to the researchers, there are several differences related to customary inheritance law in Kotaagung District, Tanggamus Regency, Lampung Province with previous research. Previous research only discussed customary inheritance law without comparing it with Islamic inheritance law. And how the differences and similarities between Islamic inheritance law and customary inheritance law in Kotaagung Subdistrict, and the focus of the research is the people of Kotaagung who experience the local customary law culture.

Materials and Methods

This type of research is field research, which is research conducted by going directly to the field (research area) to interview traditional leaders, traditional leaders, religious leaders, and heirs who understand the distribution of inheritance property. The place of this research is located in the Muslim community of Kotaagung Subdistrict, Tanggamus Regency, Lampung Province. This research is a qualitative descriptive-analysis, which explains the practice of the division of inheritance of the Kotaagung community, which maintains customs in its application.

Data collection techniques are carried out by observation, interview and documentation. As for the approach of this research, it uses a normative-sociological approach. The normative approach is intended to trace the reasons used in the implementation of the customary inheritance system based on applicable legal norms, while sociological to see the reality of the life of the

Kotaagung community in implementing the inheritance system.

Furthermore, for the Data Sources obtained in the form of Primary Data, namely the main data sourced from the words and actions of the people observed or interviewed. Data sources are recorded through notes or through recordings. This data was obtained by researchers through direct interviews with traditional leaders, religious leaders, village officials, and heirs in Muslim communities, Kotaagung District, Tanggamus Regency, Lampung Province. Meanwhile, secondary data is data sourced from all information related to the object of research in various forms, both in the form of books, journals, documentation of research results and so on. Then for data collection, namely interviews and documentation. Interview is a method of collecting data or information by means of direct question and answer with the source, in the case of this research a semi-structured interview is used using an interview guide (interview guide) so that extracting research data is easier to do so that it does not get out of the aspects that want to be explored. This interview is included in the in-depth interview category, aiming to obtain maximum information and data. And Documentation is the collection of data and materials in the form of documents. The data can be in the form of geographical location, the condition of the Kotaagung Sub-district community and its cultural conditions, as well as other matters related to the object of research.

The method of data analysis is by analyzing the problem in a qualitative-descriptive manner, namely describing the data obtained from the results of the interview. The types of methods are as follows: 1. Inductive method, analyzing data obtained from interviews about the division of inheritance property in Kotaagung Subdistrict and then generalizing a general conclusion. 2. Comparative method, comparing customary inheritance law with Islamic inheritance law, on the practice of dividing inheritance property in the community of Kotaagung Subdistrict.

Results and Discussion

Comparative analysis of Islamic inheritance law with customary inheritance law in Kotaagung sub-district, Inheritance law cannot be separated from the family system because inheritance law is part of family law. In the context of inheritance law in Indonesia, there are several differences regarding the practice of inheritance, among others, for Indonesians also applies Customary Law, which varies from region to region, for Muslims in various regions, there is a clear influence of Inheritance regulations and Islamic Religious Law. Indonesian customary law recognizes collective, individual, and majorate systems, while Islamic law only recognizes individual inheritance systems.

The community of Kotaagung Subdistrict adheres to the male majorate system, namely the eldest son (male descendant) who is the sole heir of the testator, who is entitled and gets all the inheritance from the testator. In practice, the inheritance can already be passed down to the heirs even though the testator is still alive with the obligation to take care of all his family members. This is different from Islamic inheritance law. Every time someone dies in an Islamic family, the issue of distributing the inheritance always arises. The issue of inheritance in Islam includes three things, namely who is entitled to receive the inheritance, the amount of inheritance given, and how to distribute the inheritance. These three aspects are regulated in Islamic inheritance law. Inheritance law is an implication of marriage law that determines and reflects the form of law that applies in that society. Islamic inheritance law applies the statement that, "the stronger and closer the kinship of the heir to the testator, the greater the priority for the heir to get a share".

The results of the author's observations in the field, trying to formulate from the positive and negative aspects, namely: The eldest son is made the sole heir in the practice of customary inheritance in the area is not merely that the eldest son must be respected, his needs met, given abundant property, and only for the sole pleasure of the heir, but as the author reveals above that the heir, namely the eldest son, has a heavy burden,

namely taking care of his parents, providing proper education to his younger siblings, meeting all the needs of his family. However, in practice, after the heir gets his rights, the heir often denies his obligations, neglects his family and even only wants to control his inheritance alone without taking care of his family.

Customary Law is unwritten rules that grow and develop and are maintained by the legal consciousness of the community, which is a habit ('urf) in everyday life that Based on the author's opinion, it can be concluded that the requirements of 'Urf as a method of istinbat law are: First, 'Urf must be 'urf shahih is the custom of the community that does not contradict the nash Second Generally accepted among the community whether general or specific mapun lafzi or 'amaly Third Does not bring harm and in line with the soul and healthy mind. Fourth Urf must already exist when an event occurs that is based on the 'urf. When viewed from the perspective of fiqhiyah rules which explain that: "Custom can be established as law".

In the implementation of the division of inheritance, the Kotaagung community uses more customary law that has developed since long ago than Islamic inheritance law, because they use the majorate system. Customary law as a living law is conceptualized as a legal system formed and derived from the empirical experience of the community in the past, which is considered fair and appropriate and has gained legitimacy from the customary authorities so that it is binding or must be obeyed (normative in nature)¹⁶. Although the majority of the Kotaagung community adheres to Islam, in terms of inheritance distribution, the local community uses the customs that have prevailed since their ancestors, not using Islamic law.

Based on the above explanation, the author argues that with the requirements of 'urf, there are some deviations in the practice of customary inheritance in Kotaagung Subdistrict which relate to the heirs and the provisions of the distribution of inheritance property with the provisions contained in Islamic inheritance law, on the other hand, the practice of customary inheritance in Kotaagung has a noble purpose, with the aim that the practice of inheritance of the Kotaagung community wants to

uphold justice so that there is no conflict between families and maintain the continuity of family welfare properly. Similarities and differences between Islamic inheritance law and customary inheritance law in Kotaagung Sub-district Islamic inheritance law and customary inheritance law in Kotaagung sub-district have the same pillars, namely: heirs, heirs, and inheritance. The difference lies in the definition of heirs, namely according to the customary inheritance of the Kotaagung community, the heir can inherit his heir if he is an adult, even though the heir is still alive.

Conclusions

Inheritance law in Kotaagung Subdistrict uses the customary inheritance system, which has been a habit for generations in the community to maintain the customary inheritance system rather than the Islamic inheritance system. The practice of Lampung customary inheritance in Kotaagung Subdistrict is very different from the practice of Islamic inheritance law. These differences can be seen in when inheritance occurs, the process of dividing the inheritance, who is entitled to get the inheritance and uses a family system and deliberation. However, over time the practice of customary inheritance there has experienced the development of the law used, no longer fanatical about the customary inheritance law that has been applied due to the mixing of tribes and local customs.

The implementation of customary inheritance today, the people of Kotaagung Subdistrict mostly still use the local inheritance law that has been in effect before, but some people also choose to use Islamic inheritance law in resolving inheritance disputes that occur in their families even though the distribution process is not in accordance with its provisions. Similarities and differences between Islamic inheritance law and customary inheritance law in Kotaagung Subdistrict. The settlement of customary inheritance disputes in the Kotaagung community uses a family system and deliberation while Islamic law refers to the basis and source of Islamic inheritance, namely, the Qur'an and Hadith. Based on the above explanation, the author

argues that with the requirements of 'urf, there are some deviations in the practice of customary inheritance in Kotaagung Subdistrict relating to the heirs and the provisions of the distribution of inheritance property with the provisions contained in Islamic inheritance law, therefore the practice of customary inheritance in Kotaagung Subdistrict can be said to be 'urf fasid because it contradicts the Qur'an and Hadith as the main source, even though it meets the other requirements in 'urf. On the other hand, the practice of customary inheritance in Kotaagung has noble intentions, with the aim that the Kotaagung community wants to uphold justice so that there is no conflict between families and maintain the welfare of the family well.

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Learning Al-Qur'an Hadith Using Cooperative Learning Method Type Numbered Heads Together (NHT) to Improve Student Learning Outcomes at MAN Pekalongan

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Abstract: The negative impacts of using group work methods can be avoided when teachers spend more time and attention preparing and developing appropriate group work methods. One method that can be used in cooperative learning, namely structured group work/study, which includes five main elements: positive interdependence, individual responsibility, personal interaction, collaboration skills, and group processes. This research aims to reveal the influence of cooperative learning with the Numbered Head Together model on al Qur'an hadith learning outcomes and to find out how far the understanding and mastery of al Qur'an hadith subjects is after implementing the Numbered Head Together model of cooperative learning. The cooperative learning model Numbered Heads Together has a positive impact in improving student learning achievement which is marked by increasing student learning completeness in each cycle, namely cycle I (60.71%), cycle II (75.00%), cycle III (89.29 %). The implementation of the Numbered Head Together model of cooperative learning has a positive influence, namely it can improve student learning outcomes in studying the al-Qur'an hadith.

Keywords: al-Qur'an hadith learning, cooperative learning, numbered heads together

Introduction

Madrasah is a general educational institution with Islamic characteristics, so its curriculum should be designed to strengthen religious moderation, character education (PPK), anti-corruption education, literacy as well and the formation of noble morals in pupils. The curriculum of the madrasah should also be developed taking into account the objectives of national education, the objective of the Madrasah, the development of science and technology, and the demands of the times. Especially in the face of the industrial revolution 4.0, the madrasah must be able to prepare the competence of the pupils in the millennial era to be capable of implementing 21st century learning with the ability to have 4C (critical thinking, creativity, communication, and collaboration).

Facts prove that the implementation of learning in the 21st century is still controlled by the general perception that the duty and duty of teachers is only to teach and transfer science. Teachers see students as people who know a lot and are the only source of information. What is concern is that students are studying in burdensome and frightening situations because of the overshadowed demands to pursue only high test scores and exams.

This is the impact of the general perception that leads to the student's inactivity in pursuit of learning. Students act only as listeners and are not yet able to speak to express an opinion or to convey or answer a question. This fact is also largely because students are still in an adaptation phase, i.e. the transition from primary to secondary education. So the old patterns that happened in the old school were brought to this day.

The problem of student inactivity also occurred among the students of MAN Pekalongan. It's visible as learning goes on. When a teacher submits a question for discussion, only one, two, or three students play an active and bold role in expressing their opinions. This inactivity raises a question for the teacher, whether the student is inactive because he doesn't understand the material or because he does not dare to speak in the classroom. In connection with the student's incomprehension with the material, the teacher has anticipated providing early learning material that is distributed on the teaching material on the e-learning site of the madrasah, so that at the next meeting the student can ask the teacher.

And if the problem is left to last, it will have an impact on the quality of the graduate student. Therefore, urgent treatment is needed and the best solution is sought so that the learning objectives can be achieved as expected, whether by pupils, parents, teachers, educational institutions, or even the government.

Teachers are facilitators in learning and teaching components that have an important role in achieving learning goals. Teachers determine the success of the educational process because the teacher is directly involved in it. Based on the above questions, researchers offer solutions in learning with the cooperative learning model type Numbered Heads Together (NHT).

As has been revealed by Wina Sanjaya (2012) designing learning needs to use various types of methods, media, and appropriate learning resources so that the learning process takes place effectively and efficiently. The selection and application of learning methods in the design of learning implementation plans should be according to the needs that can cultivate the habit of productive thinking and practice for students in the achievement of learning goals. A proper learning method can provide some facility in understanding a subject matter and can create conditions that enable students to further develop and even improve skills or attitudes so that the student's learning process can be more effective, efficient, and enjoyable without excluding other elements such as learning methods, media, learning resources, and so on. Several approaches

to learning are often applied among them: learning methods with cooperative approaches, contextual learning, quantum learning, and integrated learning.

Cooperative Learning is an approach to learning through the use of small groups of students to work together in maximizing learning conditions to learning goals. (Houlobec, 2011). Human beings have varying degrees of potential, historical background, and future expectations, and therefore human beings can be disappointed. (saling mencerdaskan). Cooperative learning consciously creates interactive interactions so that the source of learning for students is not only textbooks and teachers but also fellow friends. In addition, human beings as social beings must interact with love and care to avoid misunderstandings and misunderstanding.

Cooperative learning is a system in which there are interrelated elements. The elements are: (1) positive interdependence; (2) face-to-face interaction; (3) individual accountability; and (4) the skills to establish interpersonal relationships or social skills that are deliberately taught. (Abdurrahman & Bintaro, 2000).

Numbered Heads Together cooperative learning is very effective in improving student activity. (Sri Puji Retno et al., 2021). The advantages of the NHT learning model can involve students in completing tasks, increasing individual responsibilities, improving group performance, learning to train the skills of each individual, and increasing the spirit of learning and satisfaction in the group (Efendi et al., 2023). The NHT-type cooperative learning model can also be applied to students who have both high and low reading habits (Sahida & Abdurahman, 2023).

The type of learning number head together was developed by Spencer Kagan (1993) by involving students in a mere view of the material covered in a lesson and checking or testing their understanding of the content of the lesson. As a substitute for direct questions to the entire Class, the teacher uses the following four-step structure:

- a. *Step 1 – Numbering The teacher divides the students into groups or teams of 3 to 5 people and gives them numbers so that each student in the team has a different number.*

- b. *Step 2 - Questioning* The teacher asks a question to the student. The questions can vary, from specific to general.
- c. *Step 3 - Head Together* Students in each team think together to describe and assure that everyone in the team knows the answer.
- d. *Step 4 - Answering* The teacher named a number and the students from each group with the same number raised their hands and prepared answers for the whole Class.

Learning outcomes are closely related to learning achievements. Nawawi (1981) presented that the understanding of learning outcomes is the success of students in studying the lesson material in the madrasah that is expressed in the form of a score or score of the test results on a certain number of lessons.

Experts in education and psychology try to identify factors that affect learning outcomes. Knowing the factors that influence learning outputs, the implementers and actors of learning activities can give positive interventions to improve the learning outcome that will be obtained. Implicitly, two factors influence a child's learning outcomes, internal factors and external factors.

The Qur'an and the hadith are two sources of Islamic law and a very important source of knowledge to be studied. The purpose of the subjects of the Quran hadith in Madrasah Aliyah has been mentioned in the Decree of the Minister of Religion No. 183 of 2019 on the curriculum of Islamic Religious Education (PAI) and Arabic language at Madrasa. There are various alternative learning methods, learning media as well and teaching materials that can be developed and used to improve student learning results such as using multimedia from PowerPoint. (Zarkasi & Taufik, 2019), learning using mind maps (Zarkasi Zarkasi, 2022), using integrated internet teaching materials (Zarkasi Zarkasi, 2023), Android-based learning (Mu'minatin & Zarkasi, 2023), or adapting the teaching material to the student's developmental stages (Mustafid et al., 2023), And so on.

Based on the above background, researchers are encouraged to conduct research in the form of PTK (Class Action Research) by applying the

cooperative learning model type numbered heads together (NHT) to improve the learning results of the Qur'an in Class X IPA 3 MAN Middle Java. From the background of the above problems, several problems will be solved namely: Does the application of the Cooperative Learning Model Type Numbered Heads Together (NHT) influence the learning outcome of the Quran in the students of Class X IPA 3 MAN Network? How do students of Class X learn about the subject of the Qur'an by applying the cooperative learning model type numbered heads together (NHT)?

Materials and Methods

This research is action research because it is carried out to solve learning problems in the classroom. It also includes narrative descriptive research, as it describes how a learning technique is applied and how desired results can be achieved.

This research is being carried out at the Man Market. The subjects in this study are students of Class X of IPA 3 MAN Pekalongan, while the teacher of the Qur'an hadith subject acts as the perpetrator. There are 31 students in Class X of IPA 3. Data in this survey consists of two types, namely: Primary Data and secondary Data. The primary data source in this research is the application of NHT in learning activities, while the secondary data or supplementary data is written materials such as the textbook Al Qur'an Hadits Class X IPA 3 and the Internet data source that supports research to obtain relevant data.

The data required for this study was obtained through observations of learning performance, observations on student and teacher activity, formative tests, questions, and interviews. Data validity is a series of forms of degree accuracy in a research variable that connects the research process on the research object with the data by a researcher. (Sugiyono, 2012).

Results and Discussion

The data required for this study was obtained through observations of learning performance,

observations on student and teacher activity, formative tests, questions, and interviews. Data validity is a series of forms of degree accuracy in a research variable that connects the research process on the research object with the data by a researcher.

The observation sheet data is taken from two observations, namely the observation data on the management of cooperative learning of the Numbered Heads Together model, which is used to determine the impact of the application of the cooperative model of learning of Numbered Head Together in improving the learning performance of students and the data of observation of student and teacher activity.

Item Details Analysis

Before carrying out the data collection through the research instrument as a test and obtaining a good test, the test data is tested and analyzed. The analysis of the tests carried out included:

1. Validity

The validity of the subject matter is intended to determine the validation of the test so that it can be used as an instrument in this research. Out of the counting of 16 questions, 6 are invalid and 10 are valid. The results of the validity are summarized in the table below:

Table 1. Question of Valid and Invalid Student Formative Test

Valid Question	Invalid Question
1, 2, 3, 4, 7, 9, 10, 12, 13, 14	5, 6, 8, 11, 15, 16

2. Reliability

Matters that have qualified validity tested their reliability. r_{11} reliability coefficient of 0.554 is obtained from the calculation. This price is greater than the r price of the product moment. For the number of questions ($n = 16$) with r (95%) = 0,374. Thus, the test questions used have qualified for reliability.

3. Difficulty Level (P)

Difficulty level is used to determine the difficulty level of the question. Analysis shows that of the 16 questions tested, there are: 6 easy questions, 6 moderate questions, and 4 difficult questions.

4. Differential Power

Differential power analysis is performed to determine the ability of the subject to distinguish students with high abilities from students with low abilities.

From the analysis of differential power obtained questions with criteria less than 6 questions, criteria enough there are 4 questions, and good criteria there are 6 questions. Thus, the questions test used have met the conditions of validity, reliability, level of difficulty, and differentiation.

Cycle Research Data Analysis

1. Cycle I

a. Planning

At this stage, the researchers prepare a learning tool consisting of lesson plan 1, formative test questions 1, and supporting teaching tools.

b. Activities and Implementation

Implementation of teaching-learning activities for cycle I is carried out in Class X IPA 3 with a total of students 31 students. In this case, the researcher acts as a teacher. As for the teaching-learning process, it refers to the curriculum that has been prepared. Observation is carried out in conjunction with forced teaching.

At the end of the teaching-learning process, students are given a formative test to know the student's success rate in the learning process of teaching that has been done. The results of the study on cycle I are as follows:

Table 2. Summary of Student Formative Test Results in Cycle I

No	Reproduction	Cycle I Outcome
1	Average formative test values	78,22
2	Number of students studying	22
3	Percentage of learning accuracy	70,96

From the above table, it can be explained that by applying the cooperative learning model Numbered Heads Together obtained an average student learning achievement score is 78.22 and learning accuracy reaches 70.96% or there are 22 students out of 31 students who have already completed the study. The results show that in the first cycle, classically students have not completed the learning, because students who have achieved a score ≥ 65 are only 70.96% less than the desired percentage of accuracy by 85%. This is because

students are still new and strange to the new methods applied in the teaching process.

c. Reflection

In the implementation of teaching-learning activities obtained information from observation results as follows:

- 1) Teachers are not good at motivating students and communicating learning goals.
- 2) Teachers are not good at time management.
- 3) Students are less enthusiastic as learning continues.

d. Revision

Implementation of teaching activities in this cycle I am still deficient, so there is a need for revision to be done in the next cycle.

- 1) Teachers need to be more skilled in motivating students and more clear in communicating learning goals, where students are invited to be directly involved in every activity that will be done.
- 2) Teachers need to distribute time properly by adding the information they feel necessary and making notes
- 3) Teachers should be more skilled and enthusiastic in motivating students so that students can be more enthusiastic.

2. Cycle II

a. Planning

At this stage, the researchers prepare a learning tool consisting of lesson plan 2, formative test questions II, and supporting teaching tools.

b. Activities and implementation

Implementation of teaching-learning activities for cycle II is carried out in Class X IPA 3 with a total of students 31 students. In this case, the researcher acts as a teacher. The teaching-learning process refers to the curriculum with consideration for the revision of cycle I, so that errors or shortcomings in Cycle I do not occur again in cycle II. The observation is carried out simultaneously with the implementation of teaching.

At the end of the teaching-learning process, students are given the formative test II to know the level of success of students in the learning process of teaching that has been done. The instrument

used is the formative test II. The results of the study on cycle II are as follows:

Table 3. Student Formative Test Results in Cycle II

No	Reproduction	Cycle II Results
1	Average formative test values	71,79
2	Number of students studying	21
3	Percentage of learning accuracy	75,00

From the above table obtained average student output score is 71.79 and the accuracy of learning reaches 75.00% or there are 21 students out of 28 students who have completed their studies. These results show that in cycle II the classical learning intensity has improved slightly better than in cycle I. There is an improvement in this student's learning outcomes because students assist less capable students in the subjects they are studying. Besides, there are teachers' abilities that are beginning to increase in the teaching prose.

c. Reflection

In the implementation of learning activities obtained information from observation results as follows:

- 1) Motivate students
- 2) Guiding students to formulate conclusions/discover concepts
- 3) Time Management

d. Plan Revision

There are still shortcomings in the implementation of study activities in this cycle II. Therefore, there is a need for a revision to be implemented in the second cycle, among others:

- 1) Teachers in motivating students should be able to make students more motivated during the teaching-learning process.
- 2) The teacher should be closer to the student so that there is no fear in the student to submit opinions or questions.
- 3) The teacher must be more patient in guiding the student to formulate conclusions/find concepts.
- 4) The teacher has to distribute time well so that learning activities can go as expected.
- 5) The teacher is better at adding more examples of issues and giving training questions to students to be done on each learning activity teaching.

3. Cycle III

a. Planning Stage

At this stage, the researchers prepare a learning tool consisting of lesson plan 3, formative test questions 3, and supporting teaching tools.

b. Activity and observation levels

Implementation of teaching-learning activities for cycle III is carried out in Class X IPA 3 with a total of students 31 students. In this case, the researcher acts as a teacher. As for the teaching-learning process, it refers to the curriculum with consideration for the revision of cycle II, so that errors or shortcomings in the second cycle do not occur again in the third cycle. Observation is carried out in conjunction with teaching-learning.

At the end of the teaching-learning process, students are given the formative test III to know the level of success of students in the learning process of teaching that has been done. The instrument used is the formative test III. The results of the study on cycle III are as follows:

Table 4. Student Formative Test Results in Cycle III

No	Reproduction	Cycle III Results
1	Average formative test values	77,14
2	Number of students studying	25
3	Percentage of learning accuracy	89,29

Based on the above table, the average score of the formative test was 77.14, and of the 31 students who have passed 25 students and 3 students have not reached the level of study. Then classically, the accuracy of learning has been achieved at 89.29%. (termasuk kategori tuntas). The results of the 3rd cycle have improved better than the 2nd cycle. The improvement of the learning outcomes of the third cycle is influenced by the improvement in the ability of the students to learn the subject matter that has been applied during this period as well as the responsibility of the group of students who are prepared to teach their untrained friends.

c. Reflection

At this stage, I will study what has been done well and what is still not well in the teaching-learning process with the application of the cooperative learning model numbered head together. The data that has been obtained can be suspended as follows:

1) Through the learning process the teacher has performed all the learning well. Although some

aspects are not perfect, the percentage of implementation for each aspect is quite large.

2) Based on the observation data, it is known that students are active during the learning process.

3) The deficiencies in previous cycles have been improved and improved so that they are better.

4) Students' learning results in the third cycle have achieved considerable improvement.

d. Implementation Revision

In the third cycle the teacher has implemented the cooperative learning model Numbered Head Together well and seen from the student activity as well as student learning outcomes the implementation of the teaching-learning process has gone well. Then there is no need for too much revision, but what needs to be considered for the next store is to maximize and maintain what has existed with the aim that in the implementation of the teaching-learning process the application of the cooperative learning model Numbered Head Together can improve the learning process of teaching so that the learning objectives can be achieved.

Discourse

1. Accuracy of Students' Learning Outcomes

Through this survey results show that the cooperative learning model Numbered Head Together has a positive impact in improving student learning performance. This can be seen from the students' growing understanding and mastery of the materials submitted by teachers over the years (learning intensity has increased from the I, II, and III cycles) respectively 60.71%, 75.00%, and 89.29%. In the III cycle, the classical learning intensity of students has been achieved.

2. Teacher's ability to manage learning

Based on data analysis, obtained student activity in the cooperative learning process model Numbered Head Together in each cycle is improved. This has a positive impact on the improvement of student learning outcomes and mastery of the material received during this period, i.e. can be demonstrated by the increasing average grade of students in each cycle that continues to experience improvement.

3. Teacher and Student Activities in Learning

Based on data analysis, student activity in the process of learning al-Quran hadith using the cooperative model Numbered Head Together is the most dominant is, listening/paying attention to the teacher's explanation, and discussion between students or between students and teachers. So it can be said that content activity can be categorized as active. Whereas the activity of teachers during learning has implemented cooperative learning measures model Numbered Head Together well.

This is evident from the teacher's activities among the activities of guiding and observing students in the work of activities, explaining material that students do not understand, giving feedback or evaluation, or questioning answers, where the percentage for the above activity is quite large.

Conclusions

From the results of the learning activities carried out over three cycles, and based on the entire discussion as well as the analysis that has been done, it can be concluded as follows: Numbered Heads Together model cooperative learning has a positive impact in improving student learning outcomes characterized by increased student learning accuracy in each cycle, i.e. Cycle I (60.71%), Cycle II (75.00%), Cycle III (89.29%).

The application of the Numbered Head Together cooperative learning model has a positive influence, i.e. it can improve the learning motivation of students in learning Al-Qur'an Hadis, it is demonstrated with the enthusiasm of students who stated that students are interested in the learning cooperative model Numbered head Together so that they become motivated to learn.

The Numbered Head Together cooperative learning model has a positive impact on student cooperation, which is demonstrated by the presence of responsibility in a group where a student who is already trained teaches his friend who is not yet trained.

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The Ethical Implications of AI in Expressing Religious Beliefs Online: A Restatement of the Concept of Religion

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Abstract: This research aimed to discuss the significant impact of AI on worship activities in digital religion, considering its presence led to an ambiguity in understanding religion due to user-influenced content. While this allows easy access to religious studies, AI possibly weakens users in determining the legitimacy of sources. For Muslims, the legality and inheritance of spiritual knowledge are fundamental, especially in the era of AI technology. This paper is exploratory research using qualitative methods and data sources with a psychological approach to explore the meaning of religion as a restatement in terms of AI discourse. Religion in Islam is al-Din, which refers to the beliefs, faith, behaviour, and teachings of a Muslim, both individually and collectively, who have noble power and desire towards self-improvement to become a perfect human (*insan kamil*). For Muslims, their entire ethical life is worship because Islam is a complete way of life. AI as external assistance and the soul and conscience of religious people are the main determinants based on faith, knowledge, and charity. Understanding religion with appropriate sources of knowledge produces individuals with pacified, tranquil souls and a strong conscience.

Keywords: AI, Religious Belief, Restatement, Religion, Representation

Introduction

Online socialisation has become integral to everyday life in the fast-paced digital era. The Internet and social networks offer opportunities to connect with individuals worldwide, share information, engage in online activities, and chat. Nonetheless, this shift presents technical challenges and can significantly influence individuals' values and ethics, including religious beliefs.¹ Online socialisation has changed how religious values are communicated. In the past, da'wah activities were limited to prayer houses. Still, now, they can be

done via the Internet.² Religious institutions use online platforms to communicate teachings, raise funds, and facilitate community interaction. However, online socialisation presents ethical challenges related to religion. Addressing religious differences, avoiding conflict or harassment, and discussing religion appropriately is essential. Religious ethics in online socialisation require further study.

Artificial Intelligence (AI) is an extraordinary innovation that enables machines to perform tasks that usually require human intelligence. But this has permeated every aspect of life, including religion, raising questions about its influence on

¹ Fredik Melkias Boiliu, 'Pembelajaran Pendidikan Agama Kristen Dalam Keluarga Di Era Digital', *TE DEUM (Jurnal Teologi Dan Pengembangan Pelayanan)* 10, no. 1 (2020): 107-19, <https://doi.org/10.51828/td.v10i1.17>.

² Hariya Toni et al., 'Fenomena Cyber Religion Sebagai Ekspresi Keberagamaan Di Internet Pada Komunitas Shift (Cyber Religion Phenomenon as a Religious Expression on the Internet in the Shift Community)', *Jurnal Dakwah Risalah* 32, no. 1 (2021): 56, <https://doi.org/10.24014/jdr.v32i1.11626>.

religious beliefs and experiences.³ AI can aid in interpreting religious texts, allowing researchers and religious leaders to explore deeper meanings. However, using AI in religious contexts raises ethical questions. Can it replace clerics (ulama', priest, monk, etc) in providing spiritual guidance? Does it compromise the authenticity of religious experience by reducing the human element in interactions with God? These are essential questions that need to be addressed.

AI interpreting sacred texts raises ethical questions. How to use the data? Can AI chatbots replace religious leaders in providing guidance? There are growing concerns about how the use of data in AI technology could impact personal privacy in religious contexts. It is important to know how religious data is used and stored and how to protect personal data related to religious beliefs. As the relationship between AI and religion is evolving, individuals using AI applications must pay attention to whether information and data collection sources are clear and accurate. Because AI is trained based on data available on the internet, the information it provides may not be factual.⁴

Materials and Methods

The impact of Artificial Intelligence on Islam is explored through a qualitative approach that involves psychological analysis of data gathered from preaching studies, case studies, and social media templates. The aim is to understand how AI intersects with religion and influences ethical and moral values. In this research, data is collected through discussions and literature reviews to identify national and international journals that provide authorship data. Trusted sources, such as documents and books, are also used to gather information regarding the effects and impact of

religion on AI. The aim is to obtain accurate and factual data.

Results and Discussion

A. Ethical Dilemma in Religious Symbolism by AI

A computer science expert, John McCarthy (1997), offers a more technical definition of AI. He says AI is "the science of making machines do things that require human intelligence." McCarthy also said that AI involves using algorithms and other technologies to create intelligent machines.⁵ Artificial Intelligence (AI) can be interpreted as intelligence created by a computer system to resemble how humans think and behave. Artificial Intelligence (AI) plays a crucial role in enhancing the performance of computer systems, enabling them to replicate human-like behaviour. This field is rapidly advancing, and we can expect more groundbreaking developments in the future. AI can never replace human teachers in education. However, it can be a useful tool to assist in the learning process. Therefore, individuals must prepare themselves for the challenges that come with AI advancements and embrace their potential for the future.

With the rise of AI, people are increasingly turning to machines for answers to their problems, rather than seeking out experts in specific fields. While this shift is a natural result of technological advancements, it also brings many positive changes and developments. Religious representation encompasses how religious beliefs, doctrines, practices, symbols, and other aspects of religion are expressed or interpreted, such as through texts, images, works of art, rituals, or media.⁶

A survey conducted by Populix in April 2023 revealed that 45% of workers and entrepreneurs in Indonesia have used AI tools. ChatGPT is the most widely used AI application in Indonesia, followed by Copy.ai, Luminar AI, Oracle, Dall-e, and

³ Egi Sukma Baihaki, 'Islam Dalam Merespons Era Digital', *SANGKÉP: Jurnal Kajian Sosial Keagamaan* 3, no. 2 (2020): 185–208, <https://doi.org/10.20414/sangkep.v3i2.1926>.

⁴ Natalie. (2023). ChatGPT General FAQ. OpenAI. <https://help.openai.com/en/articles/6783457-chatgpt-general-faq>

⁵ John McCarthy, 'What Is Artificial Intelligence?', 1 January 2004.

⁶ Faisyal, "Between AI, Humans, and Religious Activities", *Oratio Directa Journal* Vol.5, No.1, July 2023, p. 918

Lalal.ai. Outmatch is the least used AI platform. The majority of respondents used AI applications more than once a month. The survey involved 530 employees and entrepreneurs from a total of 1,014 respondents, with most respondents coming from Java. The age of the respondents ranged from 17 to 55 years, with the majority being in the 17-25 age group.⁷

According to the KBBI, religious representation refers to the act of paraphrasing words to convey the same meaning as another phrase in the sentence. This repetition is in line with the meaning of "re" in English. Representation is a fundamental aspect of cultural studies, as defined by Chris Barker. It involves the social construction of meaning and its representation to society in various forms. The purpose of representation is to convey values, understanding, and meaning related to a particular religion to individuals or groups with different religious backgrounds, beliefs, and knowledge. Religious representations can vary widely and depend on specific cultural and social contexts. The primary objective of religious representations is to help individuals comprehend, identify, and explain religious beliefs and practices. However, it is important to note that the way a religion is expressed can also influence people's perception and understanding of that religion. As a result, religious representation is often the subject of important ethical and cultural debates in increasingly connected and multicultural societies.⁸

In this increasingly interconnected age, religion can use technology and artificial intelligence (AI) to express itself, which is another similarity to many other cultural and social facets. The term "religious representation" describes how religion or religious ideas are portrayed, understood, or presented in many contexts, media, and cultures. Depending on the viewpoint, intent, and setting, representations of religion can differ greatly. Artificial intelligence (AI) technology has several applications for

religion in the modern era. Religion can accomplish this in the following ways:

1. Religious organisations can create mobile apps and websites to provide easy access to religious information, prayers, sacred texts, and other resources.⁹
2. Online religious education is a convenient way for adherents of a religion or individuals interested in studying a particular religion to access courses and educational materials. With the help of AI, learning materials can be customized based on the user's level of understanding, making the learning experience more effective and personalized.¹⁰
3. Religion is often depicted in various forms of media such as visual arts, literature, music, and film. These forms of media can portray religious stories, characters, or concepts.¹¹
4. Religious symbols represent faith, such as the cross in Christianity, the crescent moon and star in Islam, the Om in Hinduism, or the Swastika in Hinduism and Jainism are examples of deep symbolic representation in religion.¹²
5. Religious rites and rituals or religious ceremonies, such as mass, worship, and fasting, are symbolic actions with religious meaning.
6. Sacred texts, doctrines, and religious theology are essential and powerful tools to present and explain religious beliefs and doctrines. These teachings not only provide guidance and

⁹ Hariya Toni et al., "Fenomena Cyber Religion Sebagai Ekspresi Keberagamaan Di Internet Pada Komunitas Shift (Cyber Religion Phenomenon as a Religious Expression on the Internet in the Shift Community)," *Jurnal Dakwah Risalah* 32, no. 1 (2021): 56, <https://doi.org/10.24014/jdr.v32i1.11626>. p.58

¹⁰ Prof K H Saifuddin and Zuhri Purwokerto, "Tantangan Dakwah Melalui Media Sosial Di Era Media Baru" 02 (1917): 146–58.

¹¹ International Conference, Strengthening Islamic Studies, and Dakwah IAIN Ponorogo, "Proceeding of The 3rd FUAD's International Conference on Strengthening Islamic Studies (FICOSIS) Vol 3 (2023) Faculty of Ushuluddin, Adab and Dakwah IAIN Ponorogo 461" 3 (2023): 461–69.

¹² Abdullah Muslich Rizal Maulana, "Agama Digital (Digital Religion) Dan Relevansinya Terhadap Studi Agama Interdisipliner: Sebuah Tinjauan Literatur," *At-Ta'fikir* 15, no. 2 (2022): 35–56, <https://doi.org/10.32505/at.v15i2.4821>.

⁷ Cindy Mutia, *Survey: ChatGPT is the most popular AI application in Indonesia*, databoks, 06/26/2023, at 12:00 WIB

⁸ Aliff Nawi et al, "A Preliminary of Muslim Experts' Views on Artificial Intelligence," *Islamiyyat* 43, No.2 (11 November 2021): p. 3-16

advice to followers but also serve to deepen their understanding and connection to their faith. Through the study and understanding of these teachings, individuals can develop a stronger sense of spirituality and purpose in their lives.

7. Architectural structures such as mosques, churches, cathedrals, temples, and other places of worship are more than just physical spaces. They embody the values and principles of a particular religion, acting as a tangible representation of faith. These structures have the power to inspire and evoke a sense of awe and reverence in visitors, drawing them closer to their spirituality. By visiting these awe-inspiring places, individuals can experience a profound sense of belonging and connection to something greater than themselves.
8. Religious harassment and stereotyping are serious issues that can lead to harmful consequences. Unfortunately, religion is often portrayed negatively or in a misleading way, which can result in stereotypes, prejudice, and misunderstandings towards certain religions. It's important to be aware of this and to strive for a better understanding and respect towards all religions.
9. Media representation of religion can influence people's perceptions and create stereotypes or religious conflict. The media must present unbiased and accurate information about religion, avoiding harmful or misleading representation that can give rise to stereotypes and prejudice. By doing so, the media can help promote greater understanding and tolerance among different religions and prevent misunderstandings that can lead to conflict.¹³

Artificial intelligence has proven helpful in assisting religious practices and helping devout individuals worship. From a robot priest in Japan to AI-powered fatwa systems, technology is changing how we approach religion. However, it is crucial to note that implementing AI for such purposes should come with a careful evaluation of

ethical and safety issues. Microsoft's six essential tenets for responsible AI - security, privacy, fairness, accountability, inclusion, and trust and safety - should be a guiding principle for using AI in religious contexts. Developing trustworthy and responsible AI is critical as AI continues to penetrate essential goods and services. If we use AI in religious contexts, we must ensure it adheres to ethical and security standards. By doing so, we can facilitate religious rituals while also being mindful of the implications of implementing AI in religious practices.

Religious expression in AI can vary between and even within the same religion and can achieve consensus by engaging with other religious groups and thought schools. Thoughtful representation promotes tolerance and kindness, while technology should not harm or denigrate other religions. Awareness of ethical and cultural issues is critical for positive religious expression in the digital age.

B. Religion as a Guide to Technology Ethics

Science and religion have always been essential for human progress. Religion promotes discipline and organization in life, and it can prevent the misuse of technology.¹⁴ Syed Muhammad Naquib Al-Attas, a prominent scholar who merged religion and science, put forward the definition of religion. He applied this concept to the Islamization of Present-Day Knowledge framework to show that religion should permeate and transform all aspects of life. People often ignore the truth when it comes to religion, which leads to the theft of knowledge and the critical process of Islamization. Islamization aims to promote human freedom by breaking the constraints imposed by fictional narratives and systems of control, which often hinder independent thinking and the pursuit of genuine faith in positive ideals.¹⁵

Al-Attas also explained that the modern world faces various challenges, including the loss of adab

¹³ Studi Kasus, "Wacana Gerakan Hijrah Di Website Keislaman Indonesia", Pembimbing Agama Dan Media Sekolah Pascasarjana Universitas Islam Negeri (UIN) Syarif Hidayatullah Jakarta," 2022.

¹⁴ Mohammad Muslih, Heru Wahyudi, and Amir Reza Kusuma, "Integrasi Ilmu Dan Agama Menurut Syed Muhammad Naquib Al-Attas Dan Ian G Barbour," *Jurnal Penelitian Medan Agama* 13, no. 1 (2022): 20, <https://doi.org/10.58836/jpma.v13i1.11740>.

¹⁵ Syed Muhammad Naquib Al-Attas. (2022). *Islam and Secularism*. Kuala Lumpur: Ta'dib International, p. 69

or proper conduct and manners and the proliferation of technology that has become an essential aspect of human existence. As a result, the ethical use of artificial intelligence presents a complex issue that needs more consideration in the present time.¹⁶

Artificial Intelligence (AI), developed by Alan Turing,¹⁷ is a key innovation in Society 5.0, enabling efficient living and human survival.¹⁸ Its applications include image and speech recognition, autonomous vehicles, medical diagnosis, inventory management, and product recommendation.¹⁹ The Society 5.0 paradigm will have a significant impact on building a more content, fulfilled, and ultimately more productive society.²⁰ Artificial Intelligence (AI) has been around since 1956, but the theories that led to its development have existed since 1942. The term AI emerged and was put forward in 1956 at the Dartmouth conference.²¹ Although AI is not a new concept, its development and innovation are always evolving, as stated by Muhammad Ali Ramdhani, the Director General of Islamic Education (Pendis) during an online webinar on the theme "Artificial Intelligence and The Role of Humans: Issues Concerning Character Education" organised by the National Research and Innovation Agency (BRIN).²²

¹⁶ Ibid. p. 23

¹⁷ Ting Guo, "Alan Turing: Artificial Intelligence as Human Self-Knowledge," *Anthropology Today* 31, no. 6 (2015): 3–7, <https://doi.org/10.1111/1467-8322.12209>.

¹⁸ Elizabeth Koumpan and Anna W Topol, "Society 5.0 A Vision for a Privacy and AI-Infused Human-Centric Society Driving a New Era of Innovation and Value Creation BT - Proceedings of Eighth International Congress on Information and Communication Technology," ed. Xin-She Yang et al. (Singapore: Springer Nature Singapore, 2023), 229–39.

¹⁹ Erik Brynjolfsson, "The Turing Trap: The Promise & Peril of Human-Like Artificial Intelligence," *Daedalus* 151, no. 2 (2022): 272–87, https://doi.org/10.1162/DAED_a_01915.

²⁰ Andreia G. Pereira; Tânia M. Lima; Fernando Charrua-Santos, "Industry 4.0 and Society 5.0: Opportunities and Threats," *International Journal of Recent Technology and Engineering (IJRTE)* 8, no. 5 (2020): 3305–8, <https://doi.org/10.35940/ijrte.d8764.018520>.

²¹ Sutojo, T. (2011). Artificial intelligence. First Edition. ANDI OFFSET. Bandung, p. 3

²² <https://pendis.kemenag.go.id/read/dirjen-pendis-kecerdasan-buatan-bekal-sikap-dengan-bijak-borne-respons-dan-etika>.

As AI technology advances, it is being applied in various social and community contexts to provide solutions that can improve people's lives. Many AI-powered platforms are emerging, which prioritise human needs. Social media platforms are an example of this trend. In the 21st century, social life is closely linked to electronic devices, and all human communication and information now originate from cyberspace. People prefer to engage in social interactions through cyberspace,²³ which has been further fueled by the proliferation of mass media platforms that offer consumers enticing experiences, including content and FYP (For Your Page) requests that are more concise and direct. As a result, Virtual media users increasingly embrace this mode of communication.

Religion can play a vital role in shaping the ethical principles governing the use of AI technology. Different religious beliefs and interpretations may have distinct perspectives on using AI. In Buddhism, for example, the principle of Ahimsa, which promotes non-violence towards all living beings, can guide the development and use of AI. Ahimsa is an ancient philosophy shared by various religions, including Jainism, Hinduism, Sikhism, and Buddhism. The principle of Ahimsa, famously advocated by Mahatma Gandhi, was instrumental in India's struggle for independence from British colonial rule. In the context of AI, Ahimsa can serve as a moral compass, ensuring that AI technology is developed sustainably and with accountability. Ahimsa can help prevent the creation of AI tools, such as autonomous weapons, that threaten the safety and well-being of living organisms. By embracing ethical principles such as Ahimsa, we can create a future where AI technology is used only for the betterment of humanity and our planet.²⁴

Christians believe that humans are created in the image of God, called Imago Dei. This concept emphasizes human value and dignity and requires

²³ Yuangga Kurnia Yahya and Umi Mahmudah, "Echo Chambers Di Dunia Maya: Tantangan Baru Komunikasi Antar Umat Beragama," *Religi: Jurnal Studi Agama-Agama* 15, no. 2 (2019): 141, <https://doi.org/10.14421/rejusta.2019.1502-02>.

²⁴ M. Ali Imron, *SELAYANG PANDANG AGAMA HINDU & BUDDHA* (Yogyakarta: DIVA Press, 2023), p.53.

respect for the rights of others. Christians apply this concept to the development of AI technology to consider its ethical implications.²⁵ Buddhism lacks explicit teachings on AI, but its principles can guide technology use.²⁶ Christians view AI differently; some consider it a way to honour God's creation, while others question its ethical implications.²⁷

Islamic realm considers technology and science to enhance understanding of God's will. AI can be positive if used for good purposes, such as advancing science, the welfare of humanity, and social justice. AI should be used by Islamic ethical principles and not violate religious values. Islam encourages technological innovation while adhering to its values of doing good deeds and being rewarded in the afterlife,²⁸ by wisdom called *Hikmah* which is mentioned in the Al-Qur'an in the QS. Al-Baqarah [2] Verse: 269.²⁹

Abdullah bin Bayyah, a Contemporary Muslim scholar from Mauritania, Africa, at the Rome Call for AI Ethics 2023, stated that religion, in general, fully supports all human efforts aimed at happiness in this world and the hereafter; Islam always encourages its people to work and innovate through Allah's verses that can be read in the Quran, as well as in the universe.³⁰

²⁵ Laurence Tamatea, "Online Buddhist and Christian Responses to Artificial Intelligence," *Zygon* 45, no. 4 (2010): 979–1002, <https://doi.org/10.1111/j.1467-9744.2010.01145.x>.

²⁶ Michael Cooper, "Interdisciplinary Communication by Plausible Analogies: The Case of Buddhism and Artificial Intelligence" (University of South Florida, 2022), p.16. <https://www.proquest.com/openview/2413f9f5000f79b74b9bdd2aebc874f5/1?pq-origsite=gscholar&cbl=18750&diss=y>.

²⁷ Jefrie Walean Royke Lepa, Tri Hartono, Hery Adijanto, Amiruddin Wasugai, Retnalisina Sinauru, Henny Mamahit, Freliyanti, Eka Lago, Dekrius Kuntaua, *PARADIGMA SPIRITUALITAS KRISTEN DI ERA 5.0* (Yogyakarta: Andi Publisher, 2022).

²⁸ Muhammad Haris, "Pendidikan Islam Dalam Perspektif Prof. H.M Arifin," *Ummul Quro* 6, no. Jurnal Ummul Qura Vol VI, No 2, September 2015 (2015): 1–19, <http://ejournal.kopertais4.or.id/index.php/qura/issue/view/531>.

²⁹ Wahbah Az-Zuhaili, *Tafsir Al-Munir: Aqidah, Syariah, & Manhaj Jilid 2*, ed. Achmad Yazid Ichsan, 8th ed. (Jakarta: Gema Insani, 2013), p. 92–94.

³⁰ Lukman Hakim, Muhammad Risqil Azizi, "OTORITAS FATWA KEAGAMAAN DALAM KONTEKS ERA KECERDASAN BUATAN (ARTIFICIAL

There are numerous ways in which AI can contribute to the improvement of the lives of Muslims. Contemporary platforms play a significant role in promoting Islamic values and fostering a sincere comprehension of the religion's ethics and morals. For instance, the FYP platform and its content disseminate Islamic preaching and offer prayer features and other Muslim guides, while Zabihah facilitates the search for halal food.³¹ The numerous AI platforms will persist in their integration with human existence, particularly for Muslims who continue to rely on these platforms for guidance; this ensures the continued viability of AI or artificial intelligence due to its unwavering dependability.

Humanitarian ethics requires monitoring AI's consequences to ensure its benefits without harming humanity. AI is valuable, and Islamic teachings emphasize resource optimization and progress. Therefore, AI should be pursued to enhance human empowerment,³² especially for Muslims. However, more understanding of technology's limitations necessitates further exploration.

Islamic values emphasize the importance of ethics and responsibility in the implementation of artificial intelligence. These values include justice, rejection of discrimination, and responsibility for consumers. AI should not only be about technology but also its impact on improving people's lives.

C. Restatement of Religion Facing AI Issues

AI's beneficial implications for Islamic religion are enormous, but it also severely affects social life, particularly in religious contexts. The development of AI can be viewed as an intelligent instrument for the contemplation and identification of the

INTELLIGENCE/AI)," *Jurnal Ilmiah Ar-Risalah: Media Ke-Islaman, Pendidikan Dan Hukum Islam* 21, no. 2 (2023): 164–74.

³¹ Mohamed Battour et al., "AI-Enabled Technologies to Assist Muslim Tourists in Halal-Friendly Tourism," *Journal of Islamic Marketing* 14, no. 5 (January 2023): 1291–1309, <https://doi.org/10.1108/JIMA-01-2022-0001>.

³² Abdul Rahim Karim and Hendi Sugianto, "Measuring the Future Needs of Islamic Education through the Role of Artificial Intelligence," *Proceeding of International Conference on Education, Society and Humanity* 1, no. 1 (2023): 861–70.

creations of God. The advancement of technology and research can result in positive and negative implications.³³ It is important to uphold Islamic principles and values in every aspect of life, especially when using AI so that people can have a better life.

AI's application in religious contexts has negative impacts, including misuse, resource threats, job loss, and shallow thinking (*al-ummiyah al-fikriyah*). AI algorithms often accept religious information without review, leading to a "copy-paste" habit. This can separate intellectual and emotional aspects between the mufti and Mustafa candidates, causing fatwa decisions closer to inaccuracy (*mafsadah*). The digital revolution offers placeless communication, but the disproportionate use of AI can negatively impact human emotional intelligence.³⁴

AI technology linked to religion has negative implications, including the circulation of fake or "deepfake" content.³⁵ In October 2023, Indonesian people were shocked by the video content of President Joko Widodo, fluent in Mandarin.³⁶ This highlights the unwise use of AI and indulgence in false content, which religion prohibits. Deepfake in religion involves virtual preaching studies, damaging the image of religious leaders and polluting the integrity of one party and the sanctity of the religion's name.³⁷

Deepfake technology is a method that manipulates facial data for deceptive purposes, often linked to crimes like pornography, theft, and propaganda. Its operational mechanism is

intricately linked to sensitive religious matters, necessitating a serious approach to address this issue. In a religious context, deepfakes involve the use of advanced audio and video processing technology to produce false information³⁸.

Deepfakes in religious contexts can be controversial and negatively impact understanding and relationships between religious communities.³⁹ Examples include manipulating religious leaders' words or faces, adding preaching material contrary to Islam, creating and distributing incorrect videos, and using AI to create fake verses in the name of holy books like the Qur'an. These methods can be packaged as films, content, or even manipulated prophetic stories, posing a threat to the integrity of religious institutions.

Deepfake AI, particularly those that offend Islam or other religions, can lead to internal and external conflicts, potentially causing Muslims to lose faith. Religious communities often face risks when technology is used to deceive or disrupt their religious beliefs and practices. Therefore, it is essential always to check the source of information and be careful when handling content related to religion.⁴⁰

Technology and scientific advancements make life more accessible and spontaneous, making gadgets personal assistants. Smartphone applications remind sports enthusiasts and suggest places for refreshment. Social media algorithms recognise users by providing content that aligns with their tastes, making life more accessible and enjoyable.⁴¹

Artificial intelligence is increasingly influencing our lives and information on gadgets, encouraging humans to choose their path. Muslims should be cautious in responding to AI devices that shift

³³ Aziz Mushoffa and Imam Musbikin, *Human Cloning in the XXI Century between Hope, Challenges and Conflict*, (Yogyakarta: Student Library, 2001) p. 52

³⁴ Ibid, p.169

³⁵ Ihtiram Raza Khan et al., "A Systematic Review on Deepfake Technology BT - Proceedings of Data Analytics and Management," ed. Ashish Khanna, Zdzislaw Polkowski, and Oscar Castillo (Singapore: Springer Nature Singapore, 2023), 669–85.

³⁶ <https://en.tempo.co/read/1789306/kominfo-ministry-asserts-jokowis-speech-in-chinese-produced-by-deepfake>

³⁷ Suhaib Kh. Hamed, Mohd Juzaidin Ab Aziz, and Mohd Ridzwan Yaakub, "DISINFORMATION DETECTION ABOUT ISLAMIC ISSUES ON SOCIAL MEDIA USING DEEP LEARNING TECHNIQUES," *Malaysian Journal of Computer Science* 36, no. 3 SE-Articles (July 2023): 242–70, <https://doi.org/10.22452/mjcs.vol36no3.3>.

³⁸ Nasir Tamara, *Demokrasi di Era Digital*, (Jakarta: Yayasan obor Indonesia, 2021) p.373

³⁹ Keith Raymond Harris, "Video on Demand: What Deepfakes Do and How They Harm," *Synthese* 199, no. 5 (2021): 13373–91, <https://doi.org/10.1007/s11229-021-03379-y>.

⁴⁰ Heidi A. Campbell, *When Religion Meets New Media* (London & New York: Routledge, 2010), p.19-32.

⁴¹ Michael Reskiantio Pabubung, "Era Kecerdasan Buatan Dan Dampak Terhadap Martabat Manusia Dalam Kajian Etis," *Jurnal Filsafat Indonesia* 6, no. 1 (2023): 66–74, <https://doi.org/10.23887/jfi.v6i1.49293>.

beliefs and facts. They should consider how future generations will be wiser and more innovative. AI is not yet used in mosques to replace preachers, but many industries are supporting religious activities, such as using telescopes for *ru'yatu-hilal* purposes or supporting Muslim life.⁴²

AI is a crucial tool in personal and professional interactions, potentially altering people's views. However, without strong knowledge and faith, AI can lead to misinterpretation. To mitigate potential threats, a robust legal and ethical framework is needed. Further research and awareness about AI's impact are crucial. A responsible approach can minimize risks and direct AI towards positive human benefits.

Conclusions

The use of artificial intelligence (AI) in religious expression entails integrating AI with the principles of Islam. This essay highlights how technology calls for extra consideration for people's privacy, cultural awareness, and ethical education. Likewise, the most crucial aspects of adopting AI are customers' efforts to keep developing just algorithms, as well as their great ethical awareness and duty. To ensure that technology is used in a way that promotes peace and respect for religious diversity, Muslims in this environment need to strike a balance between their right to freedom of speech and their tolerance for the beliefs of others.

The integration of Islam into artificial intelligence necessitates a profound comprehension of ethics, morality, and responsibility. This includes ensuring privacy, avoiding bias, and being accountable for AI development. It also necessitates understanding long-term social impacts, sustainability, and international cooperation to address ethical issues faced by AI users.

Islamic values and principles significantly influence the way we think about artificial intelligence (AI). These values include ethics, responsibility, significant applications of AI in life, careful use to avoid losses, respect for user privacy

and freedom, and continuous integration of creativity and innovation. These values can be applied in various ways depending on personal understanding and social perspective. Despite the diverse views on how Islam influences AI, Islamic teachings often emphasise ethical principles, responsibility, and human welfare. Therefore, understanding the influence of Islamic values on AI is crucial for promoting ethical and responsible AI use.

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The Ethical Influence of Artificial Intelligence (AI) in Religious Education: Implications, Challenges, and Innovative Perspectives on the Merdeka Curriculum

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Abstract: This study aims to analyze the influence of the ethics of artificial intelligence (AI) in the context of religious education on the Merdeka curriculum using the five force analysis theory which intends to identify the challenges and opportunities that will arise in integrating AI into the independent curriculum. This study uses a qualitative method with a case study approach at several Islamic educational institutions. The research informants are several educators in Islamic educational institutions. Data was collected through observation, in-depth interviews, and analysis of Merdeka curriculum documents. The results of the study show that the ethics of artificial intelligence (AI) in religious education in the Merdeka curriculum with a five-force analysis, the use of AI is the result of rapid technological developments. The use of AI can help create interactive and adaptive learning experiences. Implications The use of AI for a student has positive and negative implications. Positively, AI can help educators design more effective learning strategies and help educators research more quickly and efficiently. Learners can access material in a way that is appropriate to learning. However, the negative implication is that there is a potential change in the role of educators with technology, as well as risks related to the privacy and security of student data. Challenge, Integrating AI in religious education requires in-depth knowledge and maintaining a balance between the use of technology and in-depth human interaction in religious learning, and technical risks such as AI integrity errors against religious concepts, therefore the need for deeper human interaction. Innovative Perspective, the application of AI in religious education in the Merdeka curriculum can open doors for various innovative perspectives such as developing learning platforms.

Keywords: Ethical Influence, Artificial intelligence, Religious Education, Independent Curriculum.

Introduction

The Ethics of Artificial Intelligence (AI) in Religious Education is an increasingly relevant topic in an era of ever-evolving education. As education is a field that is always in a dynamic transformation along with technological developments. One of the latest innovations that is increasingly dominating the scope of education is Artificial intelligence (AI), which has a major impact on various aspects of the learning process. AI as a technology that is capable of performing tasks that previously could only be done by humans, has a significant influence on various

aspects of life, including education. When talking about the ethics of AI in the context of religious education, we open the door to a variety of deep considerations. Especially how AI affects ethics in religious education. Education should be a means to form individuals who are creative, innovative, and able to think critically. (Amelia, 2023)

AI, short for *Artificial Intelligence*, is a field of computer science that aims to create machines that can process information and learn from words in a manner similar to human intelligence. This allows AI systems to understand, analyze, and make complex decisions. (Cox, 2021) In education, the use of AI can open up new opportunities,

including personalization of learning, monitoring learner progress, and developing more adaptive curricula. As human intelligence and advanced technology are used to accelerate technological and social progress, humans remain a key factor in decision-making, creativity, and problem-solving. (Sugiarto & Farid, 2023)

Artificial Intelligence (AI), in the context of Religious education, AI has provided several significant advantages. AI can be used to provide learning materials tailored to the needs of learners, even providing an understanding of religious concepts. The use of AI in religious education has significant implications. One of them is the ability to provide customized learning, allowing students to learn at a level that suits them and increasing the efficiency of learning. However, this also raises questions about the security of learners' data. In addition, there is potential for AI to influence how learners interact with their religion and religious values.

The challenges of implementing AI in religious education must be properly addressed. This is due to the lack of ethical understanding of how AI should be used in the context of religious education. In addition, there are still differences of opinion on the extent to which AI can replace the role of teachers in understanding and teaching religious values. Given society 5.0 that humans can utilize AI intelligence emphasizes the role of the human component in innovation. So humans remain the key to decision-making, creativity, and problem-solving. (Sugiarto & Farid, 2023)

In the context of the Merdeka Curriculum, which emphasizes independence and innovation in education, the influence of AI in religious education provides an innovative perspective. Merdeka Curriculum allows for flexibility in learning and assessment methods, and AI can be a powerful tool to realize this vision. However, it is necessary to ensure that religious and ethical values remain a central focus in developing this innovative curriculum. The use of AI in religious education also faces several implications that need to be carefully considered. A proper understanding of religious values and their impact on the quality of religious education are important considerations. These challenges must be

addressed wisely to ensure that the use of AI in religious education meets high ethical standards. (Tran & Nguyen, 2021)

In this article, we will explore in more depth the ethical influence of AI in religious education, discussing implications, challenges, and innovative perspectives in the context of an independent curriculum. All this is to understand how the use of AI can make a positive and sustainable contribution to religious education while upholding crucial ethical and religious values.

Materials and Methods

This study is a qualitative research. This research adopts data accumulation techniques through observation, in-depth interviews, and document analysis. It also utilizes the *Five Forces* framework to examine the ethical aspects associated with the use of artificial intelligence (AI) in religious education in the Merdeka Curriculum. The *Five Forces* analysis will further evaluate the potentials or attractions that are considered strengths in the use of AI in religious education, as well as identify weaknesses or potential risks that may arise from the use of this technology.

The combination of research methods and data collection techniques outlined above aims to gain a more comprehensive understanding of the implications, constraints, and innovative perspectives in the context of using artificial intelligence (AI) in Religious Education in the Merdeka Curriculum. The approach also aims to achieve an effective way of analyzing the ethical impact of the application of AI technology in religious education.

Results and Discussion

A. Five Forces Analysis (Porter Model)

The Five Forces analysis technique initiated by Michael E. Porter is considered a credible and more practical alternative analysis technique compared to the more commonly used SWOT (strengths, weaknesses, opportunities, and threats) analysis. The assessment conducted according to the five

forces technique can assess potential strengths and weaknesses, as well as understand the dynamics of the market industry. (Newton & Bristoll, 2011) Although the five forces framework is more popularly used in business contexts, the principles of the five forces can be used to analyze the education sector.

The five key factors used by the five forces model to identify and evaluate potential opportunities and risks are competitive rivalry, threat of new entrants, threat of substitutes, bargaining power of suppliers, and bargaining power of customers.⁷ The Five Forces Analysis can be applied in the context of education, especially the use of artificial intelligence (AI) in religious education in the Merdeka Curriculum as follows:

1. Competitive Rivalry in Religious Education

The ability to understand the actions and strategies of competitors is a key to success for an institution. The level of competition that exists between institutions varies and it is important to understand the different intensities of competition. Furthermore, competition can affect quality, price, and innovation. (Newton & Bristoll, 2011)

In the education sector, the threat of competition between educational institutions can include institutional reputation, curriculum, and facilities. More specifically in the use of AI in religious education in the Merdeka curriculum, the threat of competition that is likely to be received by educational institutions is the availability of religious education programs that use AI in learning. As a result, educational service institutions that also adopt the use of AI in religious learning are increasingly competing and mushrooming due to market needs. The competition also arises when the possibility of the Merdeka Curriculum does not accommodate the application of AI in learning, so a more flexible curriculum is needed.

However, due to the slightly different location of religious education from other learning, there can also be threats from competing institutions that do not use AI in religious education. This institution uses

teachers or human labor for religious learning to maintain scientific originality.

The threat of competition not only arises among educational institutions but can also arise in Artificial Intelligent technology companies when each continues to strive to improve quality and innovation. This is to offer AI solutions that can compete in the world of education.

2. Threats of New Artificial Intelligent Solutions

As with the first key factor of identifying the number and intensity of competition in AI companies, the second key factor is to identify the level of quality and specifications of an AI company. If the existing AI solutions are of high-quality value, it will be more difficult for new AI institutions to enter and challenge the existing AI companies with high qualifications. However, if an existing AI company still has a more general technology, in this case, it has not been specifically designated for religious learning, it will be easier for new challengers to emerge. (Newton & Bristoll, 2011)

AI companies that are specifically oriented toward religious learning are still not widely found, so the threat door in the emergence of new competitors of AI solutions can be present easily along with the demands. As planned by one of the State Islamic Religious Universities, UIN Datokarama plans to integrate AI in the development and knowledge of contemporary Islamic education involving international-level academics and the founder of Al-Ahsa Digital Saudi Arabia as one of the AI companies engaged in education. Many universities have begun to realize that the presence of technology will greatly support the development of Islamic knowledge, reduce time, and expedite the process of religious education. (Hajiji, n.d.) In the future, the more new AI company participants that are born will affect the level of competition in the industry.

3. Bargaining Power of Customers (Students and Parents)

An institution should assess the extent to which customers or buyers have bargaining power. In situations where customers have a strong position, they can exert great pressure on the

market and demand quality improvements and/or price reductions.(Newton & Bristoll, 2011)

The intended buyers in the context of education are students and parents. The decision to adopt AI in religious education in the Merdeka curriculum is also inseparable from the wishes of students and parents. Customers have more experience in a product than sellers. The use of AI in religious education has positive implications for students' learning experiences that are personalized and appropriate to the level of need. However, not all students need the use of AI in learning because there are also contrasting experiences that are present such as the gap in access and ability of learners caused by technological limitations, economics, and lack of resources that require adequate facilities and infrastructure. In addition to the experience, buyers can also consider other available alternatives to the use of AI in the religious education process that are more in line with the Merdeka Curriculum.

4. Threats from alternative products of religious education

The use of AI technology and substitute products in religious education has both positive and negative impacts. The positive impact allows educators and students to access learning effectively and efficiently. However, according to the results of the field research AI is also a threat to religious education this is because, in the context of religious education, it can be a problem if there is a lack of understanding of the nuances, traditions, and culture of a particular religion. (Hastini et al., 2020) AI is not always able to provide a deep understanding of religious beliefs and practices. In addition, AI can replace the role of the teacher in providing guidance and interpretation of religion, resulting in less social interaction and therefore less opportunity to discuss doubts and develop knowledge. The most important of these threats is that the products of AI have certain biases in religious understanding that can interfere with correct

understanding or spread extreme understanding. (Sanusi et al., 2022)

5. Bargaining Power of Teachers and Educators

Educators are an important factor in bargaining power because teachers with high quality and experience can bring added value that is difficult for technology to replicate. Teachers can complete personalized, creative interactions in curriculum development that are difficult for AI products to deliver. Teachers with high qualifications can maintain stronger bargaining power against AI substitutes.(Prahitaningtyas, n.d.)

The negotiation of teachers and education personnel affects the dynamics and shifts in AI's influence on education, ensuring that humans remain an irreplaceable element in delivering quality education.

B. Ethical Implications of Artificial Intelligence (AI) in Religious Education

1. Influence of AI in Religious Education

The influence of AI in religious education has been the subject of growing debate among experts. Proponents of this technology argue that AI can increase the accessibility of religious education, provide personalized learning resources, and enable better adaptation of curriculum. An example is the use of AI chatbots to answer religious questions from students instantly, allowing 24/7 access to religious information. In addition, AI can assist in analyzing students' religious development, provide recommendations for reading materials or videos that match their level of understanding, and even create engaging virtual learning environments. (Tran & Nguyen, 2021)

On the other hand, there are concerns about the negative influence of AI on religious education. The use of this technology could reduce the personal interaction between teachers and students in the context of religious education. This can take away the aspect of togetherness and spiritual experience that is often considered important in religious learning. In addition, a greater risk is that AI could be misused to spread extreme views or

promote bias in religious education. In some cases, AI algorithms may present a narrow or potentially damaging understanding of religion, which may interfere with a healthy and tolerant understanding of religious diversity. Therefore, it is important for institutions and educators to carefully oversee the implementation of AI and integrate it judiciously, ensuring that its positive influences dominate the negative ones in religious education.

2. Challenges in Integrating AI in Religious Education

Integrating AI in religious education is not without its challenges. One of the main challenges is the different interpretations of complex religious teachings. AI's limitations in understanding the rich and often ambiguous context of spirituality and morality in different religions may result in limited or even incorrect interpretations. For example, in the use of AI to teach religious teachings, algorithms may narrow down interpretations of certain religions based solely on raw data without considering broader spiritual dimensions. This can affect students' understanding of religion as a whole and lead to confusion. (Sanusi et al., 2022)

Another challenge is the proper integration of AI with a strong local culture and values in religious education. Every religious community has its unique traditions, practices, and beliefs, which cannot always be understood or interpreted correctly by AI technologies that may be based on generalized data. For example, in some religious communities, some certain practices or rituals have been practiced for generations, which may be difficult for AI to understand or implement correctly. This suggests that the adaptation of AI in religious education needs to carefully consider the local cultural context to avoid misunderstanding or ignoring important local wisdom. (Cox, 2021)

3. Ethics and Morality in the Use of AI in Religious Education

In the use of AI in religious education, the issue of ethics and morality becomes very important as this technology has great potential to influence religious perceptions and moral values. Developers and educators need to

ensure that the use of AI is done with strong ethical values in mind. For example, in the use of AI to teach ethics and morality, AI systems need to promote universal values such as compassion, empathy, and integrity. (Sanusi et al., 2022)

For example, some institutions have adopted AI to help teach moral values in religious education by using technology that prioritizes understanding and tolerance of diverse beliefs. In its implementation, AI can be used to analyze complex moral situations, provide diverse solutions, and promote critical and reflective thinking in students. A concrete example in the field is the use of AI technology in creating learning platforms that facilitate open discussions on complex moral and ethical issues, such as human rights, peace, and justice. With proper guidance, AI can help broaden students' understanding of religious and moral perspectives, enabling them to develop more open and inclusive thinking. Thus, judicious implementation of AI in religious education can strengthen important ethical and moral values in society.

C. Ethical Challenges of Artificial Intelligence (AI) in Religious Education

The government's policy of implementing the Merdeka Curriculum is essentially to provide openness for educational actors in managing, designing, and implementing learning assessments. Students are allowed to grow their thinking skills and develop their potential according to their talents. (Hadi & Handoyo, 2022) Meanwhile, teachers or educators are more facilitated in developing learning and assessment methods (A, n.d.)

The concept of independent learning in the Merdeka Curriculum is a supporting component of the Society 5.0 era by combining human abilities in utilizing technological developments. (Bungawati, 2022) Apart from creating benefits, technology utilization can also cause many obstacles.

The challenge faced in using AI technology in religious learning in the Merdeka Curriculum is the potential replacement of the role of

educators with technology, even though religious education specifically requires a balance between the use of technology and intense human interaction. Human resources that must be available in religious education are humans who are qualified, professional, and ethical in their fields so that they can be well combined with technological developments. (Maulitasari, 2021) This is to avoid other obstacles or challenges that arise such as the misintegration of AI's understanding of religious concepts. The data contained in AI is not always up-to-date and cannot be thought based on context, which implies that the answers related to a more contemporary understanding of religion are not credible. AI technology is indeed important to help us in our daily activities. However, the ability to think critically is a very human skill and one that must be continuously developed. Understanding context is also a skill that only humans have, so we can apply knowledge to different contexts. (Prahitaningtyas, n.d.)

Religious education institutions are regarded as important institutions in safeguarding morals and the source of ethics, aiming to form advanced and civilized human beings. Such challenges will be overcome as long as the "high-tech-high-touch" principle is applied. This principle is used as a reference that it is not allowed to have dependence on the most advanced technology but it is more important to improve the ability of the "high touch" aspect, namely "humans". (Ramli, 2014)

Another challenge arising from the use of AI in religious education is the threat to privacy. AI in learning can raise issues of privacy and information security, as teacher or student information can be misused or leaked.

D. Innovative Perspectives on Artificial Intelligence (AI) Ethics in Religious Education

1. Innovative Models in Religious Education Using AI

Innovative models in religious education that utilize AI technology have been in the spotlight in education. One innovative model is the use of AI chatbots that can provide automated

answers to students' questions regarding religious concepts or moral values. This provides instant and 24/7 access to religious information that can enhance student understanding. Another model involves AI to create an individually customized curriculum, where each student can follow a learning path that suits their level of understanding and interest in religion. This helps create a more personalized and efficient learning experience.

The view of an expert or professor such as Dr. Maria Smith, an expert in the field of religious education, is that innovation using AI in religious education provides an opportunity to bridge the gap in religious understanding and moral values. In her view, with a thoughtful approach, AI can be used to broaden students' horizons about different religious beliefs and practices around the world. Dr. Smith emphasized that these innovative models can help educate students to be more open, tolerant and understand the importance of religious diversity in an increasingly globally connected society. (Tran & Nguyen, 2021).

However, along with its benefits, Dr. Smith also provides a warning about the potential for unethical use of AI in religious education. He underscored the importance of ensuring that these technologies are not used to promote extremism, propagate narrow religious views, or ignore the ethical and moral values underlying religious education. Thus, in Dr. Smith's view, the implementation of AI in religious education should prioritize a balanced approach between technological innovation and strong ethical values. (Yigitcanlar et al., 2021)

2. Readiness of Educational Institutions to Adopt AI

The readiness of educational institutions to adopt AI is a crucial factor in ensuring the successful implementation of this technology in the educational process. According to Professor Sugata Mitra, an expert in education, this readiness involves several key aspects. First, educational institutions need to ensure that adequate technological infrastructure is in place, including fast internet access and the necessary hardware. In addition, training is also needed

for educators to integrate AI into learning and manage these tools properly. Correspondingly, changes in curriculum and learning strategies need to be made to suit AI's ability to personalize the learning experience. Finally, educational institutions need to have strong privacy and data security policies in place to protect student's personal information and maintain the integrity of the learning process.

The readiness of educational institutions also includes mental and cultural readiness to accept the changes presented by AI. Professor Mitra emphasized the importance of changing the traditional paradigm in education and opening up to technological innovation. Along with the development of AI, educators need to accept that their role will change, from a conveyor of information to a learning facilitator who guides students in exploring knowledge. This also creates opportunities for students to develop more relevant skills for a technology-driven world. Therefore, educational institutions must be willing to adapt their culture and mentality to suit the AI era, to provide more effective and relevant education for the younger generation.

3. Possible Development of AI Ethics in the Context of Religious Education

The possible development of AI ethics in the context of religious education has a significant impact. One relevant view in this regard comes from Dr. Raya Bidshahri, an expert in the field of ethics and technology, who expresses a positive view regarding the possible ethical development of AI in religious education. Dr. Bidshahri argues that AI can be used to teach and promote ethical principles in religion more effectively. With its ability to collect and analyze data from multiple sources, AI can help students understand their religious ethical values in a broader global context. This can enrich their understanding of cultural and faith diversity and promote a more inclusive and tolerant interfaith dialog. In addition, AI can be used to monitor and prevent the spread of extreme understandings in religious education, thereby mitigating the risk of radicalization. (Sanusi et al., 2022)

However, many are also concerned about the possible ethical development of AI in religious education. Some argue that when AI is used to teach religion, there is a risk that the technology will oversimplify religious and ethical concepts, ignoring deeper and more complex aspects. This could lead to a superficial understanding and the potential displacement of true religious ethical values. In addition, privacy and ethical issues in data collection for religious education purposes also need to be carefully addressed, given that sensitive data about religious beliefs and values are involved in the process. Therefore, it is important to consider various viewpoints and focus on developing AI ethics that can promote a deep understanding and respect for religious values and morality.

Conclusions

The Ethical Influence of Artificial Intelligence (AI) in Religious Education carries significant implications, poses challenges that need to be addressed, and also opens the door to innovative perspectives in the context of the Merdeka curriculum. While AI can enrich the religious learning experience with rich digital resources, there is a need for close monitoring of ethics, privacy, and the delivery of religious values. Challenges include the effective integration of AI in religious education that maintains the quality of human interaction and respects the diversity of beliefs. However, with a wise approach, AI can be an innovative tool in shaping the Independent curriculum, enabling personalized learning, and facilitating a deep understanding of religion in an increasingly digitally connected society.

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The Implementation of A Child-Friendly School Programme In Strengthening The Profile of Pancasila Students Based on Religious Moderation In Elementary Schools

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Abstract: The fading of the nationalist spirit of the nation's students due to the lack of implementation of Pancasila values and religious and cultural diversity in the school environment will cause cultural degradation due to the times. This research aims to analyze the implementation of the child-friendly school program in strengthening the Pancasila student profile through religious moderation. The research method used is a qualitative case study type. This research was conducted at the State Elementary School (SDN) 01 Ampenan, Mataram City, involving the principal, teachers, and students as research participants. Data collection techniques were obtained through interviews, observations, and documentation and then analyzed by data reduction, data presentation, and conclusion drawing. The results of this study indicate that 1) The implementation of the child-friendly school program can strengthen the profile of Pancasila students at SDN 01 Ampenan with various school activities such as ACIMAS, Beranyen Nyampah, Little Police, and other activities that can shape Pancasila values to students such as unity, tolerance, cooperation. 2) The implementation of a child-friendly school program based on religious moderation successfully supports the implementation of the Merdeka curriculum at State Primary School 01 Ampenan by integrating religious moderation in the learning process which can shape character values in students such as honesty, religion, democracy, tolerance, discipline, creativity, independence, responsibility, care for others and love for the country. 3) The impact of strengthening the profile of Pancasila students through religious moderation has a positive impact on students, namely creating a child-friendly environment, harmony, harmony, and a more inclusive environment, as well as increasing students' understanding of tolerance between religions. Based on these findings, it is important to integrate Pancasila values through a Child-Friendly School Programme that promotes religious moderation in improving students' nationalism as a strengthening of the Pancasila learner profile in the context of religious diversity.

Keywords: Child-Friendly School, Elementary School, Religious Moderation, Strengthening Pancasila Learner Profile.

Introduction

Character education is an important form of learning in instilling moral values in the younger generation. The culture of Indonesian society tends to have polite characteristics, upholding cooperation, mutual respect, and respect for elders (Selvia & Nyrizzati, 2017). But in reality, today many young people are starting to experience a shift in culture and character due to the times (Nida, 2020). They prefer to follow Western culture rather

than develop their own national culture, such as the lack of knowledge about the nation's diversity, the fading of politeness when walking among elders, and lack of respect for other religions and blasphemy their actions through inappropriate content on social media, and there are even students who bully their friends. Based on data from the 2018 Programme for International Students Assessment (PISA), Indonesia is in the fifth highest position out of 78 countries as the country with the most students experiencing bullying (Lohmeyer & Threadgold,

2023). The percentage of students in Indonesia who experienced bullying was 41.1% after the Philippines (64.9%), Brunei Darussalam (50.1%), Dominican Republic (43.9%) and Morocco (43.8%). The number of student victims of bullying in Indonesia is far above the average of Organisation for Economic Co-operation and Development (OECD) member countries which is only 22.7% (PISA, 2019). The many characters of the nation's young generation that have not been well formed cause moral and cultural degradation due to the development of the times that are not utilized properly (Prihatmojo & Badawi, 2020). Therefore, amid many challenges and cultural diversity, the education system needs to create an environment that not only produces academically qualified students but also has Pancasila character and can respect and understand differences between people, especially in religious contexts (Suprayitno & Wahyudi, 2020). One of the efforts to overcome these problems is to implement a child-friendly school program based on religious moderation to strengthen the profile of Pancasila students in elementary schools.

Strengthening the profile of Pancasila learners can be a relevant approach, especially in the context of culture and the realization of Merdeka curriculum implementation (Marhenno & Harsono, 2023). Forms of Pancasila values that must be embedded in students such as unity, tolerance, and cooperation provide a foundation for realizing the profile of Pancasila students who can support the goals of religious moderation and the creation of a child-friendly school environment (Septiani et al., 2023). Along with the increasing complexity of Indonesia's culturally and religiously diverse society, education should integrate the values of Pancasila in a relevant and religious moderation-based approach (Musyrihin et al., 2022). Indonesia, as a country with a diversity of religions and beliefs, needs to ensure that education not only teaches the correct understanding of each individual's religion but also educates the importance of respecting each other and appreciating other religions (Mujahid, 2023).

The Pancasila Student Profile Strengthening Project (P5) is one of Merdeka's curriculum programs to create students with Pancasila

characters (Septiani et al., 2023). The Merdeka Curriculum aims to provide opportunities for all Indonesian students to become lifelong learners who have global competence and behave according to the values of Pancasila, with six main characteristics that students must have: faith, fear of God Almighty, noble character; cooperation; independent; and creative; global diversity; and critical reasoning (Direktorat Sekolah Dasar, 2020). So students must be instilled with good character by the values of Pancasila so that they can be implemented in everyday life (Sofiyana et al., 2021).

The Child-Friendly School (SRA) program has emerged as a form of education policy that promotes inclusivity, participation, and protection of children's rights (Ruqoiyyah et al., 2021). Child-friendly schools were introduced in 1999 by the Education Section of the UNICEF Programme Office in New York. The implementation of child-friendly schools can indirectly shape the character of students because educators have been given training so that the learning process will prioritize student needs, be anti-discriminatory, provide freedom to students in learning, and consider all students the same regardless of race, religion, or culture (V. K. Dewi et al., 2021). Child-friendly schools can also support the implementation of the Pancasila student profile strengthening project because it has similarities in student character building. With schools that have implemented a child-friendly school program, the project of strengthening the Pancasila profile, which demands an independent curriculum, will be carried out optimally because the school has collaborated with parents in monitoring and shaping student character.

Religious moderation is a person's perspective to be firm in appreciating and believing in various religions as well as differences in race, tribe, religion, culture, customs, and ethnicity to maintain unity among religious communities and the Unitary State of the Republic of Indonesia (Indriani, 2023). Indonesia consists of various religions or multireligious, so it is necessary to instill religious tolerance in students from an early age to avoid stereotypes and prejudices. Therefore, by integrating the value of religious moderation in the child-friendly school program, students will form

an attitude of tolerance, mutual respect, and appreciation for friends of different religions both in the learning process and in the school environment. In addition, the knowledge gained by students will be more meaningful and can be applied in everyday life. This can have implications for a person who does not easily view others who do not agree with them with humility and hatred (Mahasiswa et al., 2022). As is the case at State Elementary School 01 Ampenen, since the Covid-19 pandemic students have often played on mobile phones so that when they enter school their words and actions change, such as using harsh sentences, often making fun of friends, not saying excuse me / bowing when passing teachers, lying to teachers so they don't pray in congregation, and so on.

This is also presented in previous research which is at least grouped through three categories. Research by M. Muttawakil focuses on religious moderation, which shows that Emha Ainun Nadjib's thoughts on religious moderation education lead to an attitude of upholding tolerance and justice among religious communities (Mutawakkil, 2020). In addition, according to the results of research by Sisca Septiani, et al, which focuses on character building in realizing the Pancasila Student Profile, which discusses the importance of promoting good character building, because good character is the basis for students to behave positively, build social relationships, and contribute to a society that has courage, honesty, and a critical attitude (Septiani et al., 2023). Similar things are also described in research by I Luh Aqnez Sylvia and Ruliati, which focuses on school culture in realizing the harmonization of religious diversity and harmony (Sylvia, 2022). The research is this study which raised the school culture program but in this research, it is more specific in the Child-Friendly School (SRA) program to create Pancasila students who get along and harmonious. In addition, Rajaleid, et al.'s research shows that schools with leadership systems that provide opportunities for teachers to try to overcome bullying among students, therefore indirectly can also improve student health by prioritizing student needs through SRA (Rajaleid et al., 2020).

Thus, this study aims to review and analyze the implementation of the Child-Friendly School

Program in the context of strengthening the student profile of Pancasila with a religious moderation approach in elementary schools. Through this approach, it is expected that students can be equipped with an understanding of Pancasila values including unity, tolerance, and cooperation, and be able to apply them in everyday life by considering religious differences. This research will examine the implementation process of the Child-Friendly School program in strengthening the profile of Pancasila students, the integration of child-friendly schools with religious moderation in primary schools, and the impact of its application in strengthening the profile of Pancasila students.

Materials and Methods

Method

This research uses a case study research method with a qualitative approach. This method will allow researchers to understand in depth the implementation of child-friendly schools towards strengthening the profile of Pancasila students and the impact of strengthening the profile of Pancasila students in religious moderation at State Elementary School 01 Ampenan. Qualitative research allows researchers to collect in-depth and detailed data (Ramadhan, 2017). The data to be obtained in this study relates to an overview of the implementation of child-friendly schools, the impact, and its integration with strengthening the profile of Pancasila students through religious moderation. This case study approach will also allow researchers to observe and analyze the situation in a specific environment (Yusanto, 2020).

The data collection techniques used in this study were in-depth interviews and observations in the school environment. Interviews were conducted by asking for explanations directly from the research subjects (principals, teachers, and students) using a voice recorder application. Observations were made directly by observing and recording student activities inside and outside the classroom as well as the way of communication and behavior towards fellow friends, teachers, and the school community. Documentation was conducted by collecting data on the child-friendly school program, the Pancasila

student strengthening project, and school activities in worship. The participants involved in this research include:

Table 1. Informant Data

Participant's Name	Status	Religions	Origin	Gender
AP	Headmaster	Islam	SD N 01 Ampenan	F
AG	Teacher	Islam	SD N 01 Ampenan	F
AS	Student	Islam	SD N 01 Ampenan	M
AK	Student	Christian	SD N 01 Ampenan	M
AH	Student	Hindu	SD N 01 Ampenan	F

Information:

M: Male

F: Female

The location of this research was at State Elementary School 01 Ampenan, Mataram City in the even semester of the 2022/2023 school year. To test the validity of the data in this study using the source triangulation technique by analyzing the same data from several different sources (D Pane, 2021). Data analysis techniques are carried out referring to the opinion of Miles and Huberman, including data reduction, data presentation, and conclusions (Miles & Huberman, 2014).

By using this research method, researchers can organize and analyze data more systematically. The data analysis table helps in collecting, categorizing, and summarising relevant quotes in the research to facilitate the discussion and interpretation of the research results (Hermawan & Amirullah, 2016).

Materials

1. Implementation of the Child-Friendly School (SRA) Programme towards Strengthening the Profile of Pancasila Students

The implementation of the child-friendly school program in primary schools is closely related to the strengthening of Pancasila values in students. This is because there are school activities that support the creation of Pancasila students. As the data from the findings obtained in the field according to the principal stated "In creating a child-friendly environment, Pancasila values such as unity, tolerance, cooperation are indirectly taught in the form of various activities at school" (AP, 2023). This was also explained by the teacher that:

"Our school has an activity called *ACIMAS* (I Love Healthy Food) and *Brayen Nyampah* (breakfast together) which is a form of SRA

program where students bring healthy food on Saturday every month, then we gather in the yard for breakfast together and students share food without distinguishing race, ethnicity, culture, or religion" (AG, 2023).

This shows that the strengthening of Pancasila values to become Pancasila learners can be instilled by students of State Elementary School 01 Ampenan, which is supported by child-friendly school programs. In addition, strengthening the profile of Pancasila learners will not be achieved if students do not have the character of patriotism from within themselves. Thus, teachers need to educate students' characters, as the teacher explained that "with the implementation of this child-friendly school, besides we are concerned with children's rights, non-discrimination, we also instill character values in them such as honesty, religion, democracy, discipline, creativity, independence, responsibility, tolerance, environmental care and love for the country" (AG, 2023). This is reinforced by students' statements that, "...we often participate as little policemen when there are national day commemoration activities" (AI, 2023). In addition, the principal revealed that, "we have no difficulty in implementing the Merdeka curriculum, which is required to implement the Pancasila student profile strengthening project because with the previous child-friendly school program we have instilled the character of patriotism as a provision for students" (AP, 2023).

This strengthening of the Pancasila learner profile is also integrated into student learning. This is applied to students in the form of discussion, democracy, making decisions, and respecting other people's opinions. As expressed by the principal, "In learning, teachers always provide opportunities for students to give opinions and we treat all students the same without discrimination" (AP, 2023). This is reinforced by the teacher that "...in learning we try to understand the character of the child, and when the child gives an opinion we will listen and appreciate any form of child achievement." (AG, 2023). Meanwhile, students explained that "in class, we are often asked by the teacher to

have group discussions and make decisions appropriately so we are getting used to deliberation because the teacher gives us freedom in learning" (AH, 2023).

2. Implementation of a Child-Friendly School Programme in Religious Moderation

Students at State Primary School 01 Ampenan consist of several religions so the school treats them fairly and instills religious tolerance to students both in the school environment and in learning. As explained by the principal, "Students here are of various religions, so for religious subjects, we have teachers according to their respective religions and different learning spaces. Islam in the mosque, Christianity in the classroom, and Hinduism in the library" (AP, 2023). To support the achievement of education that implements religious moderation, there are school activities such as religious activities and the cultivation of tolerance. As expressed by the teacher, "There are school activities that support religious moderation such as mandatory dzuhur prayer in the congregation for Muslims" (AG, 2023). This becomes a good habit for students and teaches non-Muslim students to have an attitude of tolerance to respect others who are praying, and vice versa.

3. Impact of Strengthening the Profile of Pancasila Students through Religious Moderation

Religious moderation is also integrated into classroom learning with teachers instilling character values in students such as honesty, religion, democracy, tolerance, discipline, creativity, independence, responsibility, care for others, and love for the country. Based on the observation, teachers include character values in the lesson plan by religious moderation and the principles of child-friendly schools. In addition, character education is integrated by teachers in religious learning as well as general (thematic) subjects such as discussing to instill democratic and honest attitudes; explaining religious diversity with examples of problems in everyday life to instill religious attitudes, tolerance, and care for others; and instilling disciplined, creative, responsible attitudes with various tasks or learning projects.

Based on the researcher's findings, shows that the values of Pancasila in strengthening the profile of Pancasila students through religious moderation have a positive impact on the development of student character. As expressed by the teacher, "In the school environment we always teach students to maintain mutual harmony and respect religious differences" (AG, 2023). It is also explained by students that, "we often play at recess with friends of different religions" (AI, 2023). Thus creating a child-friendly environment that is harmonious and harmonious.

In addition, based on the principal's opinion that "implementing a child-friendly school that prioritizes religious moderation, indirectly encourages the strengthening of the Pancasila student profile because they are more aware of applying values such as unity, cooperation, tolerance in Pancasila" (AP, 2023). This has a good impact on students because they begin to have positive habits and instill in themselves an attitude of patriotism and tolerance. Then, expressed by the teacher, "we can introduce a deeper understanding of the teachings of each religion through general subjects such as PPKN related to cultural and religious diversity" (AG, 2023). As reinforced by students, "we are taught by the teacher in PPKN lessons about religions in Indonesia and how we should react to them" (AK, 2023). So that students do not have the wrong view of other religions and are wise in assessing religious differences.

The integration of religious moderation in strengthening the Pancasila learner profile is also applied through school or extracurricular activities. As explained by the principal, "We also instill students' caring attitude towards others with joint social activities such as raising funds for earthquake and flood victims in Gunung Sari sub-district involving students from various religious beliefs" (AP, 2023). The teacher also revealed, "We also have an art studio that students of various religions participate in and hold art competitions related to religious diversity" (AG, 2023).

Results and Discussion

Based on the findings above, shows that the implementation of the Child-Friendly School Programme has an important role in strengthening the student profile of Pancasila. Through the Child-Friendly School program that prioritizes child participation, character training, and the introduction of Pancasila values, students become more aware of the importance of tolerance, diversity, and togetherness despite different religions (Septiani et al., 2023). Students' active involvement in decision-making and the learning process teaches them the importance of hearing others' opinions and respecting differences (Zubaidah, 2016). Pancasila values, such as democracy and tolerance, are integrated into various aspects of school life (Mujahid, 2023).

The implementation of Child-Friendly Schools also facilitates interfaith students to collaborate socialize and interact positively in extracurriculars. This helps to overcome stereotypes and prejudices, thus creating a more inclusive and tolerant environment (Musyrifin et al., 2022). The character building emphasized in Child-Friendly Schools helps students understand that the values of Pancasila are not just theoretical, but must also be practiced in everyday life (Syafitri, 2022). Thus, the implementation of the Child-Friendly School Programme has great potential in shaping a young generation that respects religious differences and can uphold the character and values of Pancasila (Afina et al., 2023). Therefore, further steps can be taken to integrate Child-Friendly Schools into the Merdeka curriculum more comprehensively and involve the entire school community in strengthening the learner profile of Pancasila.

In addition, the child-friendly school program can be integrated with religious moderation (F. A. Dewi, 2023). This is implemented because the child-friendly school program emphasizes character building, including religious character (Alawi et al., 2022). This is to the results of research according to Alawi et al that Strengthening Character Education (PPK) is implemented by applying Pancasila values in character education, especially including religious values, honesty, tolerance, discipline, hard work, creativity, independence, democracy, love for

the country, environmental care, social care, and responsibility (Alawi et al., 2022). These values are the embodiment of the interrelated core values of religiosity, nationalism, independence, cooperation, and integrity that are integrated into the curriculum (Ahmadi et al., 2020). Selain itu perilaku adil terhadap semua siswa baik laki-laki dan perempuan, dari berbagai ras, budaya maupun agama dapat ditunjukkan melalui penelitian menurut Saragih dan Subroto bahwa strategi kesetaraan aksesibilitas siswa sekolah ramah anak melalui penyesuaian perilaku siswa (Saragih & Subroto, 2023). So it can be said that the implementation of child-friendly schools integrated with religious moderation in strengthening the profile of Pancasila students can support the implementation of an independent curriculum because it is relevant to these main values.

The impact of the religious moderation approach in encouraging the strengthening of the Pancasila learner profile in schools. This approach proves that an inclusive approach to diverse religious beliefs can have a positive impact on students' character development (Ahmadi et al., 2020). Through a deeper understanding of religions and beliefs, students are better able to overcome prejudices that may arise from a lack of correct information about other religions (Fihri et al., 2023). The tolerance instilled helps to create an inclusive environment where students feel accepted and respected regardless of their religion (Abror & Rohmaniyah, 2023). By combining a deeper understanding of religion, an attitude of tolerance, and the application of Pancasila values, this approach contributes to forming a young generation that is responsible, tolerant, and respectful of religious differences in the spirit of unity.

A deeper understanding of Pancasila values, especially in the context of religious moderation, enables students to see the relevance of these values in maintaining social harmony and harmony (Sutrisno, 2019). Involvement in joint religious activities helps to transcend religious group boundaries and shape positive interactional experiences (Rahmawati & Haryanto, 2020). The integration of Pancasila values that focus on religious moderation has a significant impact on students' character development and the formation

of tolerance attitudes (Sabil, 2023). Through this approach, schools play a role in shaping individuals who respect differences, apply the principles of religious moderation, and uphold the values of unity in the spirit of Pancasila.

Conclusions

The implementation of the child-friendly school program (SRA) at SD Negeri 1 Ampenan has been found to strengthen the profile of Pancasila students. This is supported by various school and extracurricular activities such as ACIMAS, Beranyen Nyampah, Cilik police, and other activities. This program is implemented to form character values in students such as honesty, religion, democracy, discipline, creativity, independence, responsibility, tolerance, environmental care, and love for the country. In addition, the SRA program is integrated with Pancasila values such as unity, tolerance, and cooperation and taught to students in everyday life. Meanwhile, the impact of strengthening the Pancasila student profile through religious moderation has a positive impact on students, namely creating a child-friendly environment, harmony, harmony, tolerance, creating a more inclusive environment, introducing a deeper understanding of various religious teachings to overcome stereotypes and prejudices, so that students do not have the wrong view of other religions and are wise in assessing religious differences.

The limitations of this study focus on school culture or programs implemented by schools such as child-friendly schools, but it does not rule out the possibility of strengthening the profile of Pancasila students can be supported through other education programs. So the researcher's suggestion for further research can examine the implementation of adiwiyata schools in strengthening the profile of Pancasila students.

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Values of Islamic Education in The Sekujang Tradition of Serawai Bengkulu (Historical Study)

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Abstract: This research is motivated by the many cultures and traditions in Indonesia which are caused by multiculturalism, one of which is the sekujang culture in the Serawai tribe, Kepahiang district, Bengkulu province and the values of Islamic education contained therein. This research is a type of qualitative research based on field research and uses data collection methods in the form of interviews and observations which are then analyzed descriptively-normatively. Researchers are very interested in this research because they see a close relationship of friendship shown in the celebration of this sekujang tradition which until now has always been held by the Serawai tribe every Eid celebration. The purpose of this research is to see what are the values of Islamic education contained in sekujang culture that are very relevant to Islamic teachings. The researcher found that there were several values of Islamic education in the Sekujang culture of the Serawai tribal people of Kepahiang Bengkulu district and classified them into three aspects, namely religious aspects, personality aspects and social aspects.

Keywords: Values, Islamic Education, sekujang culture, Serawai tribe.

Introduction

Education is a process to help individuals recognize and pass on customs and culture as well as social institutions from generation to generation. If seen essentially, education is a form of transferring culture (science, technology, ideas, ethics and spiritual and aesthetic values) to every generation to be passed on in every life of society or nation. Just as every society has its own culture, so does the Bengkulu people, of course, have their own culture.

As it is known that culture is an element that cannot be separated from human life, because culture is the whole system of ideas, actions, results, and human work in the framework of the life of society which belongs to human beings, by learning. Apart from that, Islam has given its own appreciation of the culture that exists in a society, because with respect for culture, the cultural differences will not separate one culture from

another, instead it will unite these cultural differences.

In the development of an increasingly modern era, the term culture has become an acronym for society, traditions that have been preserved until now certainly have meaning in the form of values, social morals, and patterns of behavior that are aspects of people's lives. Judging from the implementation of the tradition which is used as cultural preservation, all people flock to witness how the tradition is carried out, one example is the commemoration of the Islamic new year carried out by the people of Bengkulu which has become local wisdom in a traditional performance ceremony, namely the Tabot Festival ceremony.

Likewise with the people of Kepahiang Regency, they also carry out a tradition that has become a culture of traditional performance ceremonies carried out by the Tapak Gedung Village community, namely the Sekujang tradition

which is carried out once a year which coincides on the eve of the Eid al-Fitr holiday.

Based on observations, in the implementation of the Sekujang tradition which was carried out on the eve of Eid Al-Fitr by the people of Tapak Gedung Village, it was seen that Sekujang actors visited all the houses of the Tapak Gedung Village community, starting from the end of the village to the base of the village. Apart from that, it was also seen that there was a kind of food provision in the form of cakes given by the occupants of the house to the Sekujang perpetrators. In the implementation of Sekujang there is also its own uniqueness where they are not in their original form but they wear masks and invite laughter from the people who witness them.

Ironically, with this problem, is the Sekujang tradition, which is the culture of the people of Tapak Gedung Village, able to contribute as well as aspects of the morality of the people of Tapak Gedung Village or the people who witness it in terms of aspects of the value of Islamic education.

Given the culture that is carried out in Tapak Gedung Village, the community considers the Sekujang tradition only as cultural preservation and a means of entertainment for togetherness in celebrating Eid al-Fitr, according to information based on observations, that in sekujang cultural performances there are religious elements. Therefore, based on the explanation above, the researcher wishes to find out more about the sekujang culture which is carried out in Tapak Gedung Village, which hopes to provide aspects of understanding the values of Islamic education

Materials and Methods

Study Area:

This research focuses on the Sekujang tradition in Serawai Bengkulu, Indonesia, with a specific emphasis on the values of Islamic education within this tradition. The Sekujang tradition is an integral part of local culture and has significant implications for educational systems in the region.

Data Collection:

Data for this research were collected from various sources. Firstly, a literature review was conducted involving history books, journal articles, and other documents relevant to the Sekujang tradition and Islamic education in Serawai Bengkulu. Secondly, in-depth interviews were carried out with local community members who have knowledge about the Sekujang tradition and its role in Islamic education.

Data Analysis:

After data collection, analysis was conducted using qualitative methods. This involved coding data from literature studies and interviews to identify key themes related to Islamic educational values within the Sekujang tradition. These themes were then further analyzed to understand how they influence educational practices in Serawai Bengkulu.

Research Procedure:

The research process began with identifying relevant literature sources about the Sekujang tradition and Islamic education in Serawai Bengkulu. Subsequently, thorough interviews were conducted with local community members to gain their perspectives on this topic.

Once data was collected, coding processes began to identify key themes within it. These themes were then further analyzed to understand relationships between Islamic educational values and educational practices within the context of Sekujang traditions. The entire research process was conducted under strict ethical guidelines ensuring reliability and validity of results.

Results and Discussion

Understanding the Value of Islamic Education

According to Abu Ahmadi and Noor Salimi, the value of Islamic education is a guide and a driving force for humans to solve various problems in their lives such as in religious, political, economic, social and cultural sciences. So that a pattern of

motivation for life goals and human behavior is formed that leads to the pleasure of Allah SWT.¹

It is very important, as a human being who has a role model to understand that all matters concerned in life in this world must have been regulated by the law in authority, and especially as Muslims to make life harmonious and towards the pleasure of Allah SWT, of course, one must understand the foundations that have been established. established in Islamic education, namely the Al-Qur'an and As-Sunnah.

According to Utari Aryani Pawito, Islamic values can be defined as concepts and beliefs that are upheld by humans regarding several basic issues related to Islam to be used as guidelines for behavior, both values originating from Allah and the results of human interaction without conflicting with the Shari'a.²

At this stage the author underlines, that Islamic values are something that is considered good, useful and most correct according to the beliefs of a person or group of people as well as concepts and beliefs that are upheld by humans regarding several main issues related to Islam to be used as a guide in behavior, both values come from Allah SWT and the results of human interaction without conflicting with the Shari'a.

There are many things related to social values and Islamic education as the author described above, then with us as human beings who are able to carry the flow of life in this world, only those values are at least what we have to implement, because the name of values depends on by advocating for it.

Word of Allah SWT:

قُلْ أَغْنِيَ اللَّهُ عَنْكَ الْفَيْسَ وَالْأَرْضَ وَهُوَ يُطْعِمُ وَلَا يُطْعَمُ ۗ قُلْ إِنِّي أَمَرْتُ أَنْ أَكُونَ أَوَّلَ مَنْ أَسْلَمَ وَلَا تَكُونَنَّ مِنَ الْمُشْرِكِينَ

Say: "Shall I make a protector other than Allah, who made the heavens and the earth, even though He feeds and does not feed?" Say: "Indeed I was

ordered so that I would be the first to surrender (to Allah), and never enter the group of polytheists" (Qs. Al-An'am: 14).³

Therefore, in this context the author provides an explanation that the values of Islamic education are a collection of life principles that are interconnected and contain various aspects of the guidance of the teachings in order to maintain and develop the existing human nature towards the formation of a whole human being (human being). kamil) in accordance with the norms or teachings of Islam.

Islamic Education

Kingsley Price in the book "Islamic Education Science" argues: education is a process by which the non-physical possessions of a culture are preserved or increased in the rearing of the young or in the instruction of adults. (Education is the process by which non-physical cultural property is maintained or developed in raising children or teaching adults). Abuddin Nata put forward Islam as a religion, namely a religion whose teachings were revealed by God to mankind, through his Messenger, Muhammad SAW. Islam in this sense of religion, in addition to carrying out the mission as brought by the prophets, is also a religion whose teachings are more complete and perfect than the religions brought by the previous prophets.

So it can be concluded, that Islamic education is a conscious effort whose purpose is to process understanding so that it is able to become a nature that is able to develop in life in accordance with Islamic teachings.⁵

Based on the Word of Allah SWT as follows:

فَتَعَلَى اللَّهِ الْمَلِكُ الْحَقُّ وَلَا تَعْجَلْ بِالْقُرْآنِ مِنْ قَبْلِ أَنْ يُقْضَى إِلَيْكَ وَحْيُهُ وَقُلْ رَبِّ زِدْنِي عِلْمًا

"So, exalted is Allah, the true King, and do not be in a hurry to read the Qur'an before it is perfected to reveal it to you, and say: "O my Lord, add to me knowledge." (Qs. Taha: 114).

¹ Ahmadi, Abu dan Noor Salimi, *Dasar-dasar Pendidikan Agama Islam*, Jakarta, PT Bumi Aksara, hlm. 4

² Utari Aryani Pawito, *Nilai-Nilai Keislaman Dalam Sinetron Televisi "Analisis Isi Tentang Nilai-Nilai Keislaman Dalam Sinetron Sakinah Bersamamu Yang Ditayangkan Oleh Stasiun Televisi Rajawali Citra Televisi Indonesia [Rcti] Periode 15 Juni–16 Juli 2015"*, Solo: Universitas Negeri Sebelas Maret, 2016, hlm 8

³ Departemen Agama RI, *Mushaf Al-Qur'an dan Terjemahannya*, 2011, hlm. 129

⁴ Hery Aly Noer dan Munzier, *Ilmu Pendidikan Islam*, Jakarta, Logos. cet. I, hlm. 3

⁵ Abuddin Nata, *Ilmu Pendidikan Islam*, Jakarta, Kencana Prenada Media Group. cet. I, 2010, hlm.33

From this verse we can take a lesson, that in learning don't be in a hurry, education is a process that is bigger than just school activities. Education, by setting aside differences in schools of thought and orientation, is a process of social development that transforms individuals from mere biological beings into social beings in order to live with the realities of their times and society.

The Concept of Islamic Culture

Islamic culture is a collection of everything that is spiritual and intellectually creative which is obtained by a certain thing and the ability to inherit and receive an inheritance which is a gift from Allah SWT which makes human beings noble.

In this Islamic culture, although there are various styles and forms, it turns out that it also contributes to parts of human culture in general. Islam views humans as supporting creatures and creators of culture.

"As a result of humans using their minds and thoughts, feelings and knowledge, culture grows in the form of attitudes, behavior, ways of life or in the form of rhythmic objects, shapes and so on".⁶

From the above understanding, it can be concluded that in addition to welfare and tranquility, culture can also be dangerous in life because culture, according to thoughts and feelings alone, without consideration of ethical and religious norms, will cause harm, both to the perpetrators themselves and to other people. others, because of that culture must be bound by ethical and religious norms.

"Islam is seen not only as a binder, but also as a source of culture. Islamic culture is created by Muslims themselves, because Muslims think and act according to the guidelines outlined by Islamic teachings. They have two important theories: First, it states that culture Islam is divided into two parts, (1) consisting of internal Islamic knowledge solely derived from the Al-Qur'anulkarim, the Sunnah of the Prophet and the sciences of interpretation, fiqh, ushul-fiqh, monotheism and others, (2). It consists

of external knowledge which is quoted by the Muslims from foreigners by way of translation.⁷

Based on the expert's opinion above, it is clear that between Islam and culture have a very close relationship, because culture without being based on knowledge originating from Islamic religious teachings, the culture will not be directed. Therefore, one thing that needs to be understood collectively, Islam is a religion that is a symbol of belief and belief that is able to provide detailed explanations and as a reference sourced from the Al-Qur'an and As-Sunnah.⁸

Sekujang History

The history or origins of the formation of the Sekujang performance ceremony are as follows:

"The term Sekujang is used to refer to an ancestor named Sebujang. The term Sebujang was originally Si ujang which is a nickname for adults who are still not married. Si ujang used to live on a plantation called the Padang Capo petalangan, namely Dusun Tunggal Kait and Dusun Jauh. The name of the Hamlet is still developing into a fairly large village located in Sukarajo District, South Bengkulu. As a result of the plantation being far from the hamlet, they did not know that the day had entered the Idul Fitri holiday. In simple circumstances, they went straight to the hamlet by cheering while chanting rhymes in the form of satire and praise at the people's homes. Long story short, they are given food by the community because apart from appreciating the old man he can cure diseases."

According to the author, based on the meaning of Sekujang, there has been a purpose explained by the Elders, which is to use it to recite (ask), and to commemorate the ancestral history and to celebrate Eid Al-Fitr. However, the author underlines that the purpose of implementing Sekujang is not only to ask for, commemorate ancestral history and enliven Eid Al-Fitr, but rather the purpose of Sekujang is to convey an understanding of the values of Islamic education, the hope of which is that the community is not only cultural Sekujang but to understand the meaning

⁶ Muhammad Ghallab, *Inilah Hakikat Islam*, Bulan Bintang, Jakarta, hlm. 102

⁷ Zakiah Daradjat, *Ilmu Pendidikan Islam*, Bumi aksara, Jakarta, hlm. 8

⁸ *Ibid*, Hal.104

of Sekujang itself in terms of the Islamic educational values contained therein.

"According to Alperi, Sekujang originates from stories of people moving from Padang Capo to the Sukaraja Seluma area. This story describes brothers who have been separated for a long time. Some moved to Sukaraja Seluma, some lived in Padang Capo. After many years, his brother who lives in Padang Capo has a feeling of longing to meet his brother who has moved to Sukaraja, especially since the holidays are approaching. The brother who lived in Padang Capo decided to look for his brother who had left. During the 27th Ramadan, the group departed for Sukaraja with an uncertain direction. Long story short, after 3 days, when it was Eid al-Fitr, two brothers who had been separated for years met. Siblings who have just arrived are very hungry and thirsty, so they beg for cakes at home using beautiful rhymes so they can get food and build friendship ties.

From some of the history of Sekujang described, the author concludes that the events that have been experienced by previous people, especially the Serawai tribe community, are of course very clear, which have become traditions of the Serawai people, so that they are able to be preserved, maintained and cultivated by the people of Serawai, Tapak Gedung Village, Tebat Karai District. Bittersweet.

Implementation of Sekujang Culture

One thing that needs to be understood, in several activities that basically of course involve the community and various types of intuition, especially problems in traditional ceremonial performances, namely cultural performances. In fact, to achieve good expectations in an implementation, of course, there must be a good design and stages as well. Therefore, through this problem the implementation of the Sekujang culture carried out by the Tapak Gedung Village community has stages in the implementation of Sekujang, these stages include:

a. Preparation phase

In preparation for the implementation of Sekujang carried out by the people of Tapak Gedung Village, those who support the smooth running of the Sekujang implementation procession include:

b. discussion

At the deliberation stage that was carried out, this involved elders, the village head and elements of the Tapak Gedung Village government, BPD, BMA, priests and officials, all Youth Organizations, and some of the Tapak Gedung Village community who were involved in implementing Sekujang. In the deliberation held at 19.30 WIB and taking place at the Tapak Gedung Village hall, the purpose of this deliberation was none other than to discuss the issue of implementing Sekujang. Starting from determining the time of Sekujang, the division of the Sekujang actors.

c. Equipment Manufacturing

In the implementation of Sekujang, equipment and tools that must be prepared are as follows:

- 1) A pinch of betel, symbolizing honor
- 2) The shabby clothes depict the life of the Talang Kait and Dusun Jauh people.
- 3) An old man (grandfather or grandmother) who uses a stick represents a very difficult situation to live in Petalangan.
- 4) Masks, in the process of making masks that are made to resemble bear heads and scary masks, this symbolizes life in the forest which is harsh and full of threats.
- 5) The torch is used as a tool for lighting.
- 6) The basket is used to accommodate gifts from the host.
- 7) The healer or shaman is a person who is smart about medicine and this is to grant the host's wish.
- 8) The priest functions to pray for the host, if he asks to be prayed for and that the host's gift becomes a blessing.
- 9) Tambourine as a taboo (musical) instrument, which is used in the process of meradai (asking) performed by Sekujang actors while reciting rhymes that are sung for the occupants of the house.

Culture, as shared knowledge, has the meaning of cultivating, preserving, managing, and developing from traditions handed down by ancestors which become customary laws and habits in a society's life whose purpose is for a social system in life. With the existence of culture which is the root of tradition, religious doctrine teaches its adherents about attitudes and behavior,

in addition to beliefs which as a whole are intended for the formation of a complete human being who will contribute to the glory of human life.

Likewise, culture, through its various types of institutions, has the function of instilling, knowing and understanding which is oriented towards the realization of a harmonious, developing, peaceful and prosperous, humane and religious life order. With the existence of Sekujang culture, this tradition has become an object of preservation whose purpose is as a form of trust and honor which is used as a symbol of society in general, especially for the people of Serawai, namely Tapak Gedung Village, Tebat Karai District, Kepahiang Regency which is still considered sacred.

Based on the research findings on the understanding of the values of Islamic education in the Sekujang culture, the authors provide the following analysis:

1. Religious Value

According to the author's analysis, prayer is one way to ask or beg Allah SWT, because through prayer is a form of approach to the creator. That's why humans are recommended by Allah SWT to always pray in every step of their life.

The author's analysis, based on the word of Allah SWT:

﴿وَقَالَ رَبُّكُمْ ادْعُونِي أَسْتَجِبْ لَكُمْ﴾

"Pray to me, surely I will allow you" (QS. Ghafir: 60).

Based on the word of Allah SWT above, the authors conclude that in fact prayer will provide benefits with the permission of Allah SWT, and a Muslim should pray a lot every time, because prayer includes worship which has a very noble position in the sight of Allah SWT.

2. Social Value

According to the author's analysis, the meaning of social values can be considered through the text of the rhymes sung by the sekujang actors.

Cit Bedecit muni kelambit

Muni kecira dibaleng tungku

Ala ke keghit guma ini

Munikan lelang dibaleng tungku

Artinya:

Berdecit suara kelelawar

Suara burung kucira di belakang tungku

Alangkah kikir rumah ini

Menyembunyikan kue dibelakang tungku

From the rhyme text line above, in the third line "Ala keghit gumah (How miserly is this house)", according to the author's analysis in the text there is an interaction between the actors of Sekujang and the host, and continued in the fourth line "Munikan lelang dibaleng stove (Hide the cake behind the stove). It can be noted the meaning, that the third and fourth texts above, emphasize that the social values contained in the Sekujang text there do not teach a miserly life (greed, arrogant, and arrogant).

The author's analysis above, based on the word of Allah SWT:

﴿قُلْ إِنَّ رَبِّي يَبْسُطُ الرِّزْقَ لِمَنْ يَشَاءُ مِنْ عِبَادِهِ وَيَقْدِرُ لَهُ ۖ وَمَا أَنْفَقْتُمْ مِنْ شَيْءٍ فَهُوَ يُخْلِفُهُ ۖ وَهُوَ خَيْرُ الرَّازِقِينَ﴾

Say: "Indeed, my Lord widens sustenance for whom He wills among His servants and narrows for (whom He wills)". And whatever items you spend, Allah will replace them and He is the best provider of sustenance" (Qs. Saba ': 39).

Based on the word of Allah SWT, it is clear that in Islam does not teach to live miserly (greed, arrogant, and arrogant). Ironically in this life it is recommended to share and help each other.

3. Value of Politeness

According to the author's analysis, giving "Sekapur Sirih" symbolizes the politeness of the perpetrators of the implementation of Sekujang which was carried out by the Chairperson of the Customary Consultative Body (BMA) to ask permission from the Village Head as an elder in community leaders before carrying out a meradai (ask) in implementing Sekujang.

The author's analysis above is in line with the word of Allah SWT:

﴿وَلَا تَسْتَوِ الْحَسَنَةُ وَلَا السَّيِّئَةُ ۚ ادْفَعْ بِالَّتِي هِيَ أَحْسَنُ فَإِذَا الَّذِي بَيْنَكَ وَبَيْنَهُ عَدَاوَةٌ كَأَنَّهُ وَلِيٌّ حَمِيمٌ﴾

"And not the same is good and evil. Reject (the crime) in a better way, then suddenly the person

between you and between him is enmity as if he had become a very loyal friend" (Qs. Fussilat: 34).

According to the researcher's analysis, hostility can be avoided and even close friendships can be avoided, because courtesy is more capable of gaining sympathy and creating good relationships than anything else, including material things.

4. Friendship value

According to the researcher's analysis, visiting people's homes is a form of friendship. In addition, the value of friendship contained in the implementation of Sekujang can also be found in the pantun text, namely:

Anai-anai bawa batang

Betutup daun bulua

Anak moanai la datang

Kalu ado duo pulua

It means:

The termites are carried by the stem

Covered in bamboo leaves

Relatives have come

About twenty people

From the text of the pantun above, in the third line "Anak moanai is coming" (relatives have come), according to the researcher's analysis, from the third text, the meaning is a form of friendship which shows (relatives have come). The value of Islamic education in the form of friendship is a human obligation to keep it intertwined

The above analysis is emphasized by the Word of Allah SWT:

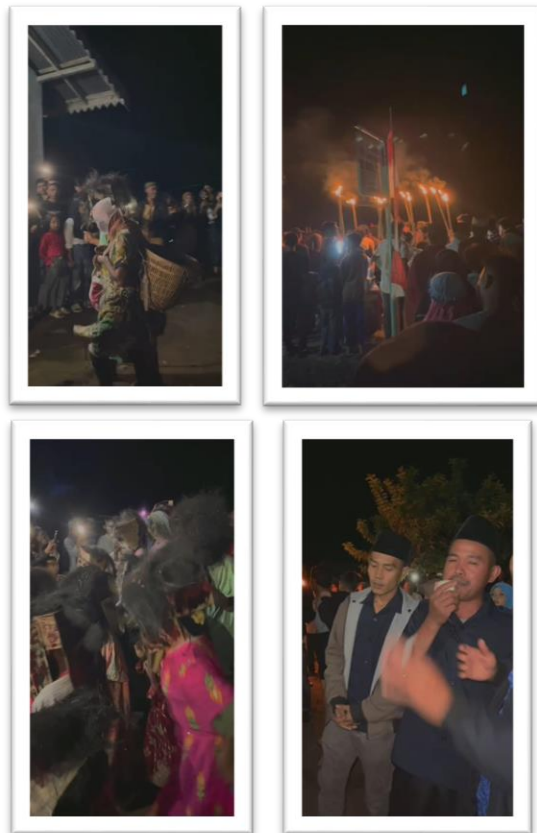
وَاتَّقُوا اللَّهَ الَّذِي تَسَاءَلُونَ بِهِ وَالْأَرْحَامَ ۚ إِنَّ اللَّهَ كَانَ عَلَيْكُمْ رَقِيبًا

"And fear Allah that by (using) His name you ask one another, and (maintain) friendly relations. Indeed, Allah always guards and watches over you" (Qs. An-Nisa': 1).

Based on the Word of Allah SWT, it is a recommendation as a priority for the people to establish friendship, in fact Allah SWT gives mercy to his people, when someone turns away, Allah SWT also turns away or decides mercy for his people. Because indeed Allah SWT is watching and knowing.

Attachment

Sekujang Implementation Documentation



Conclusions

Sekujang Culture is a performance ceremony belonging to the Serawai tribe of the Tapak Gedung Village community which is held in the month of Shawwal, namely on the third day of Eid al-Fitr which is used to meradai (ask). The stage of implementing Sekujang starts with giving a betel leaf to the Village Head as a request for permission to start the Sekujang implementation event. During the implementation of Sekujang, assisted by the Head of the BMA and the Imam, the Sekujang perpetrators came to homes and were divided into two groups, namely the left and right groups, whose purpose was to meditate (ask) and while chanting rhymes containing praise and flattery. After the process of carrying out the results of medai (asking) is complete, the food in the form of cakes will be brought to the mosque to pray and distributed evenly.

The values of Islamic education in the Sekujang culture, namely religious values; social value; courtesy values; justice value; friendship and brotherhood values.

Understanding of the values of Islamic education contained in the Sekujang culture, it was recorded that only a portion of the community had an understanding. Therefore, to increase public understanding in depth, it is necessary to clarify the values of Islamic education contained in the Sekujang culture.

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Enhancing Science Learning: Exploring Literacy and Analytical Thinking Skills (A Literature Review)

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Abstract: This study aims to provide empirical evidence on literacy and analytical thinking skills obtained through a comprehensive literature study. The approach involves searching, evaluating and synthesizing relevant literature to find problems and solutions in journals. Analysis of the literature involved understanding and identifying themes and patterns that emerged from the selected literature. Relevant information was collected and organized to produce a comprehensive understanding of literacy and analytical skills in science learning. Based on the findings of this study, it was found that the importance of developing analytical thinking skills and science literacy in learning. The development of students' analytical thinking skills and science literacy needs to be a focus in classroom learning. With the right approach, the use of relevant technology, and effective assessment instruments, it is expected that students can develop better analytical thinking skills and be able to apply science knowledge in everyday life.

Keywords: Literacy; analytic skills; science learning.

Introduction

21st century competencies are skills that are essential for students to compete and succeed in real life in this knowledge age. In the context of education, quality educational preparation is essential to improve the skills of the younger generation to face global challenges (Aryani, Susilowati, & Utami, 2022). Technological developments pose new challenges in terms of literacy and analytical thinking. For example, the ability to access information quickly and easily through the internet may affect students' ability to filter valid information and develop critical thinking skills in evaluating the information. Based on the results of the 2018 Programme for International Student Assessment (PISA) assessment, Indonesia was found to have an average reading literacy score of 371, mathematics literacy score of 379, and science literacy score of 396. In the overall ranking, Indonesia was ranked 70th out of a total of 78 countries that participated

in Programme for International Student Assessment (PISA) (OECD, 2019).

Science literacy is a primary objective of science education since it is seen as a means of preparing the current generation. Science literacy comprises concepts, processes, and scientific attitudes that are applicable in people's everyday lives, demonstrating the effectiveness of each country's science education. However, this is not fully developed through the science learning process in Indonesia (Dewi, Erna, Martini, Haris, & Kundera, 2021). Literacy development is a crucial component of students' chemistry education since chemical literacy necessitates vital critical thinking skills (Setyorini, Yamtinah, Mahardiani, & Saputro, 2021). Bacanak & Gökdere (2009) define science literacy as the capacity to comprehend and evaluate nature and its alterations resulting from human activity by means of scientific knowledge, by raising inquiries and making judgments founded on evidence.

Analytical thinking skills refer to the capability

of identifying the genuine intention and inferential relationships among various forms of expression, such as statements, questions, concepts, descriptions, or opinions. These skills are essential for facing the challenges of the present century (Prawita, Prayitno, & Sugiyarto, 2019). Analytical thinking encompasses further inquiry and situations with less defined parameters and outcomes. It is crucial when facing ambiguous scenarios that necessitate students to recognize or develop problems to be solved (Robbins, 2011)

Literacy and analytical thinking are two aspects that are important in education and everyday life. Literacy involves one's ability to read, write and understand information, while analytical thinking involves one's ability to analyze, solve problems and make decisions logically. Both play a crucial role in developing understanding, critical and reflective responses to a complex world. However, in the context of education, there are challenges that need to be addressed in relation to literacy and analytical thinking. Some of the relevant issues include high levels of illiteracy, lack of analytical thinking skills needed to deal with complex situations, and lack of integration of literacy and analytical thinking in the education curriculum. Therefore, this article aims to analyze the problems of literacy and analytical thinking and the solutions provided in education.

Science problems in everyday life can be solved if students can understand and apply analytical, creative thinking and problem solving. To gain understanding and analytical thinking in decision making, a strong foundation is needed such as seeking information from various literatures, being able to make hypotheses and being able to draw conclusions based on the results of interpretation and investigation by increasing literacy (P, Suryanda, & W, 2018). Problem-based learning is useful for improving analytical thinking skills (Syawaly & Hayun, 2020). This shows that analytical thinking and science literacy have a close relationship in problem solving.

According to James Rutherford (2011), scientific literacy includes literacy about anything related to science, while scientific literacy includes literacy about all branches of knowledge, such as science, language and social sciences. To improve students'

abilities, literacy skills must be carried out effectively, according to Shwartz, Ben-Zvi, & Hofstein, (2006) Students' ability to integrate analytical thinking skills and chemical literacy in the concept of hydrolysis is reasonable with a percentage of 56.76%. This shows that learning activities in class have not fully improved students' literacy and thinking (Prastiwi & Laksono, 2018)

This study aims to provide empirical evidence obtained through a comprehensive literature study on literacy and analytical thinking. By analyzing various relevant literature sources, this study aims to gain an in-depth understanding of problems and solutions related to literacy and analytical thinking. Its main aim is to inform practical implementation in an educational context, by providing a solid knowledge base and recommendations based on the findings of the literature.

Materials and Methods

This research uses the literature study method to investigate literacy and analytical thinking skills. this approach involves searching, evaluating and synthesizing relevant literature to find problems and solutions in journals. relevant databases and information sources were used to search for literature related to the concepts of literacy, literacy in science, and analytical thinking. afterwards, literature that met the inclusion criteria was reviewed in depth. analysis of the literature involved understanding and identifying themes and patterns that emerged from the selected literature. relevant information was collected and organized to produce a comprehensive understanding. the findings of the literature were then interpreted and linked to the research objectives.

Results and Discussion

Analytical thinking is the process of breaking down material into smaller components, taking into account a number of factors such as reasoning, degree of correlation, interpretation of diagrams, differences, focus, principles, and relevance to life

contexts (Montaku, Kaikkomol, & Tiranathanakul, 2012). according to drew, C. (2023) Analytical thinking skills are crucial in dealing with the complexity of an increasingly modern world. This process involves breaking down complex subjects into simpler components, Organising information in a structured and cohesive manner, and utilising tools such as graphs and statistics to illustrate relationships between key factors. By doing so, we can identify cause and effect and formulate solutions to overcome challenges. In addition, assessing the effectiveness of solutions and estimating their impact is also an important element of analytical thinking. Therefore, further development of analytical thinking skills is a major focus in education, so that individuals can be prepared for various professions in the modern era.

According to Anderson et al. (2015), analysis is the process of breaking down material into smaller components and establishing relationships to the overall structure. Analytical thinking involves three main processes:

1. Distinguishing: The process of sorting out relevant and important information from a structure.
2. Organising: The recognition of elements in a communication or situation and the establishment of coherent relationships between them.
3. Attributing: The process of deconstruction to determine the purpose of the elements that make up the structure.

Science analytical thinking is inseparable from science literacy. Science literacy is an understanding of science and scientific processes that enable decision-making and engagement in social and economic aspects, including specialised skills (Widyatingtyas, 2006) According to PISA in (Aqil, 2017) there are five aspects in assessing science literacy, which include recognition of scientific questions, identification of evidence needed, drawing conclusions, communication of results, and application of science concepts.

Based on the above, analytical thinking and science literacy are interrelated and support each other. The ability to think analytically, which includes breaking down material into smaller

components and considering important factors, is an important basis for the development of science literacy. Science literacy, on the other hand, involves understanding science concepts and the ability to make decisions based on that knowledge. Analytical thinking helps individuals to parse and understand scientific information, identify cause-and-effect relationships and formulate effective solutions in the context of science. Developing analytical thinking skills is therefore a priority in education to prepare individuals for the challenges of the modern era, especially to improve the increasingly important science literacy.

Based on research by Marthinu & Nadiroh (2017) students' analytical thinking skills at SMA Negeri 3 ternate are known to be low, especially in the context of environmental problems. This is due to the use of learning systems and approaches that do not encourage serious and deep student involvement, and do not pay attention to students' perspectives and analytical thinking skills in understanding natural problems. To enhance students' analytical thinking skills concerning environmental matters, the study suggests employing experiential learning techniques with an outdoor perspective. This approach enables students to obtain hands-on knowledge and use their senses to comprehend ecological phenomena. Subsequently, students can acquire inspiration, concepts and an enhanced understanding of managing environmental problems. The findings indicated that implementing experiential learning strategies, both indoors and outdoors, enhanced students' analytical thinking skills. The findings indicated that implementing experiential learning strategies, both indoors and outdoors, enhanced students' analytical thinking skills. Although both indoor and outdoor strategies proved beneficial, the latter proved more advantageous. The findings indicated that implementing experiential learning strategies, both indoors and outdoors, enhanced students' analytical thinking skills. Significantly, students possessing keen insight into sustainable development realized significantly higher gains when utilizing experiential learning strategies outdoors.

Research by Wiyarsi, Fachriyah, Supriadi, & Bin Muhamad Damanhuri (2019) identified challenges

in developing students' analytical thinking skills in chemistry learning. These challenges include the lack of emphasis on developing analytical thinking skills, students' difficulties in solving problems analytically, students' difficulties in representing chemical phenomena at the sub-microscopic level, the lack of emphasis on chemical representations at various levels, and the lack of use of tests that include chemical representations at various levels. To overcome these challenges, changes in chemistry learning approaches and the development of tests that include chemical representations at multiple levels are needed. This research recommends the development of an assessment instrument to measure students' analytical thinking and chemical representation skills in the topic "Rate of Reaction" by ensuring the validity, reliability, and suitability of the assessment instrument through assumption test and item suitability analysis.

Furthermore, Muhsin & Laksono (2023) conducted research highlighting the lack of focus on developing students' analytical thinking skills in education, particularly in chemistry learning, and a mismatch between the demands of the 21st century and the quality of education in Indonesia. Furthermore, Muhsin & Laksono (2023) conducted research highlighting the lack of focus on developing students' analytical thinking skills in education, particularly in chemistry learning, and a mismatch between the demands of the 21st century and the quality of education in Indonesia. One of the main issues is teachers' insufficient understanding of scientific attitudes.

In an attempt to address these issues, researchers have created an integrated assessment tool that aims to measure students' analytical thinking skills and scientific attitudes in relation to chemical balance materials. The validity and applicability of this tool has been scrutinised and its results indicate that the tool satisfies the required standards of validity, practicality, and substantiality. Thus, this comprehensive assessment tool can be utilised effectively to evaluate students' analytical thinking skills and scientific attitudes towards chemical equilibrium materials.

In the article titled "The Differences of Analytical Thinking Skills on Biodiversity Material in Guided Inquiry Model with Conventional Class" by Cahyati & Subali, (2022) the significance of analytical thinking skills in education is highlighted. Nevertheless, classroom education currently prioritises acquiring knowledge, resulting in students lacking practical abilities. Despite the adoption of Curriculum 2013 with a thematic and scientific approach, the analytical thinking skills of students remain suboptimal. Factors that impact students' limited analytical thinking abilities encompass daily habits, insufficient comprehension of the material, and difficulty in analysing and drawing conclusions. Contributing to this are internal factors, such as genetics, in addition to external factors, such as the social environment, culture, economy, and educational facilities.

The recommended solution is to implement a guided inquiry-based learning model in two schools. This model involves students actively in discovering and understanding concepts through structured inquiry activities guided by the teacher. Innovative class discussion methods and technology integration are also important in developing students' analytical thinking skills. Periodic formative assessments are needed to monitor student progress and provide constructive feedback.

In the journal "Exploring and Comparing Content Validity and Assumptions of Modern Theory of an Integrated Assessment: Critical Thinking-Chemical Literacy Studies" by Sadhu, Ad'hiya, & Laksono (2019) problems related to science literacy and analytical thinking in chemistry learning were also revealed. The lack of development of students' critical thinking skills and integrated chemical science literacy is one of the main problems. There is a gap between chemical science literacy and chemistry learning that is relevant to students' daily lives. In the study, the integrated assessment instrument in the field of chemical equilibrium has passed the content validity test and fulfils the assumptions in modern theory. A learning model that connects chemical concepts with real-world situations and the use of relevant technology is also suggested to improve

students' analytical thinking skills in solving chemical problems.

Overall, these studies show that the development of students' analytical thinking skills and chemical science literacy needs greater attention in chemistry learning. Through the right learning approach, the use of relevant technology, and effective assessment instruments, it is hoped that students can develop better analytical thinking skills and be able to apply chemical knowledge in everyday life.

Research conducted by Setyorini et al., (2021) identified problems with students' science literacy and analytical thinking in the context of chemical reaction rates. The lack of comprehensive assessment development and limited assessments that include chemical literacy are the problems found. This research recommends the development of assessment instruments that cover various aspects of chemical literacy. In addition, it is important to develop accurate and in-depth test result analysis tools to improve students' understanding in chemical literacy and analytical thinking skills in the context of science. This research makes an important contribution to the development of more effective and relevant chemical literacy assessments for students.

In the journal "Using HOTS-Based Chemistry National Exam Questions to Map the Analytical Abilities of Senior High School Students" by Harta, Rasuh, & Seriang, (2020), it is emphasised that implementing the concept of Higher Order Thinking Skills (HOTS) in the chemistry national exam has its own challenges. There are obstacles in developing students' analytical thinking skills in solving HOTS chemistry problems. The role of chemistry teachers in training students and the difficulty in implementing lessons that guide students in analysing and initiating analytical thinking processes are very important.

Several steps are recommended to overcome this problem. First, the development of valid and reliable research instruments needs to be done. The instrument must go through a validation process by experts and chemistry teachers. The instrument is tested on students and the results are analysed using the Rasch model. Learning strategies can be developed based on student ability analysis to

improve students' science literacy and analytical thinking skills. Collaboration between teachers and experts is also considered important in developing research instruments and learning strategies. It is expected that students' ability to solve HOTS questions can be significantly improved through the implementation of this solution.

In the journal "Effectiveness of a Generative Learning-Based Biology Module to Improve Analytical Thinking Skills of Students with High and Low Reading Motivation" by Prawita et al., (2019) discussed the low level of analytical thinking skills and science literacy among students. Conventional learning methods that rely on teacher explanations are ineffective, especially for students with low academic levels. Students' reading motivation has a significant influence on analytical thinking skills.

The suggested solution is to use a Generative Learning-based biology module that encourages students to be active in learning. This module uses simple language and integrates the Generative Learning model with indicators of analytical thinking skills. In addition, increasing students' reading motivation is also important through activities that attract students' reading interest and creating a learning environment that supports active reading and student curiosity.

It is expected that by implementing these solutions, students' science literacy and analytical thinking skills can improve. Generative Learning-based biology modules provide an interactive learning experience, while increased student reading motivation provides more access to information and improves analytical thinking skills. Based on several studies cited in these journals, it is important to develop students' analytical thinking skills and science literacy in chemistry learning. The low analytical thinking skills of students are identified as one of the main challenges in chemistry education, especially related to environmental issues. The lack of emphasis on developing analytical thinking skills in education, low science literacy, and the mismatch between the demands of the 21st century and the quality of education in Indonesia are also factors that need attention.

To overcome these challenges, several solutions are recommended, including the use of experiential learning strategies with an outdoor approach, the development of assessment instruments that include chemical representations at various levels, the application of guided inquiry-based learning models, innovative classroom discussion methods, and the integration of technology in chemistry learning. Changes in chemistry learning approaches and emphasis on chemical representations that are relevant to students' daily lives are also needed. With the right approach, the use of relevant technology, and effective assessment instruments, students are expected to develop better analytical thinking skills and be able to apply science knowledge in everyday life.

In addition, studies have also highlighted issues related to science literacy and analytical thinking in chemistry learning. The lack of development of students' critical thinking skills and integrated chemical science literacy, as well as the gap between chemical science literacy and chemical learning relevant to students' daily lives, are also of concern. Therefore, the development of assessment instruments that cover various aspects of chemical literacy, the use of learning models that connect chemical concepts with real-world situations, and the application of relevant technologies are recommended to improve students' analytical thinking skills in solving chemical problems.

Discussion

Various analytical studies highlight the problems surrounding analytical thinking skills and science literacy in the context of chemistry learning. The identification of these problems includes several main points, such as the low ability of analytical thinking among students, the lack of application of analytical thinking skills in the educational process, and the gap between the educational demands needed in the 21st century era and the quality of education in Indonesia.

The solutions offered include several strategies, such as using an experimental learning approach with an outdoor approach. In this case, direct experience through activities outside the classroom is considered to enrich students' understanding of chemical phenomena in everyday life. In addition,

there are recommendations for developing assessment tools that include chemical representations at various levels of understanding, implementing guided inquiry-based learning models that allow students to actively discover and understand concepts, and utilizing technology as a tool in chemistry learning.

However, there is still a need for more in-depth work on aspects of science literacy and analytical thinking skills in chemistry learning. There is a gap between students' critical thinking skills and integrated chemical literacy. It is necessary to develop assessment tools that cover various aspects of chemical literacy and apply learning models that link chemical concepts with real-world situations so that students can develop analytical thinking skills in solving chemical problems.

The importance of focusing on developing students' analytical thinking skills and chemical literacy is a major highlight in the context of classroom learning. It is expected that with the right learning approach, the application of relevant technology, and the use of effective assessment tools, students can develop better analytical thinking skills and be able to apply chemical knowledge in everyday life. There is also an emphasis on the role of teachers in training students and actively involving them in the analytical thinking process, as well as the importance of increasing students' reading motivation in the context of chemical science literacy. All of these need to be considered as part of efforts to improve students' understanding of chemistry.

Based on the above explanation in the context of science learning, there are problems related to the low ability of analytical thinking and science literacy among students. Although several solutions have been proposed such as the use of experimental learning approaches, the development of assessment tools, and the application of inquiry-based learning models, more in-depth efforts are still needed. The focus on developing students' analytical thinking skills and chemical science literacy is important, with the need for appropriate learning approaches, the application of relevant technology, the active role of teachers, and increasing students' reading

motivation. These things need to be considered in an effort to improve students' understanding of science.

Conclusions

The conclusion from the various studies cited in this journal is the importance of developing analytical thinking skills and science literacy in science learning. Some of the challenges faced in developing these two competencies include the low analytical thinking ability of students, the lack of emphasis on developing analytical thinking skills in education, low science literacy, and the mismatch between the demands of the 21st century and the quality of education in Indonesia.

To overcome these challenges, several solutions are recommended, including the use of experiential learning strategies with an outdoor approach in improving students' analytical thinking skills related to environmental issues, the development of assessment instruments that include chemical representations at various levels, the application of guided inquiry-based learning models, innovative classroom discussion methods, and the integration of technology in chemistry learning. In addition, changes in chemistry learning approaches and emphasis on chemical representations relevant to students' daily lives are also needed.

Overall, the development of students' analytical thinking skills and science literacy needs to be the focus of classroom learning. With the right approach, the use of relevant technology, and effective assessment instruments, it is expected that students can develop better analytical thinking skills and be able to apply science knowledge in everyday life.

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Green Technology Kit: Turning Jelantah Into Berkah a Development Research With AI for SDGs

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Abstract: Cases of environmental pollution due to used cooking oil in Indonesia are quite high, reaching 3.8 million tons every year. In this cases needed a technology that can be a solution for recycling use cooking oil waste into product with positif value which is biodiesel. The aim of this research is to develop technology that can process used cooking oil waste into products with positive value, one of which is biodiesel. This type of research is research and development with a Borg & Gall model which involves ten steps. The subjects of this research were residents of Getaspejaten Village, Kudus Regency with a sample of twenty residents. The data in this research includes assessment data from validators and field trial. Data collected using a product feasibility assessment questionnaire with the help of Google forms. Data analysis was carried out using the Rasch Model assisted by the Ministep application. This research resulted in a technology called GT KIT: Green Technology KIT which is feasible to use, seen from the analysis of field test data which shows the raw variance explained with a measurement value of 36% so that it can be said that the GT KIT was developed to meet the eligibility criteria. The development of the GT KIT product was accompanied by the development of AI technology in the form of a fast messaging service called 'GT KIT BOT' to make it easier for anyone to get solutions or responses to problems that might come up. With the GT KIT as a technology that makes it easier for anyone to process used cooking oil waste themselves, it is hoped that environmental pollution can be reduced and an alternative substitute for diesel fuel in the form of biodiesel can be created.

Keywords: AI; Biodiesel; Environtment; Green Technology KIT; Waste Cooking Oil

Introduction

Indonesian people generally use palm cooking oil for frying and other production processes, so the consumption rate of palm cooking oil in Indonesia is quite high. Based on data from the Central Statistics Agency (2021), consumption of palm cooking oil in Indonesia in 2018 reached 10.79 liters/capita/year. Consumption of palm cooking oil in 2019 and 2020 increased by 11.09 and 11.38 liters/capita/year respectively. This high consumption of cooking oil produces cooking or processing residue in the form of used cooking oil or cooking oil waste. Used cooking oil waste is included in the domestic waste category which currently ranks quite high in environmental pollution status in Indonesia, with a total amount of 3.8 million tonnes annually from various parties (Gita Septyanti, 2016).

Used cooking oil contains various dangerous substances that can threaten the health of our bodies and the environment. Used cooking oil that is reused after several frying processes will cause several diseases such as cholesterol, blocked blood vessels, heart disease, etc. (Haryono, 2010). Meanwhile, if the disposal of used cooking oil is carried out haphazardly, it can cause environmental pollution and have a bad impact on life, such as blockage of water channels because the discarded oil hardens at low temperatures, water pollution causing damage to aquatic ecosystems, even soil pollution causing drought and reduced nutrients. in groundwater, and the death of soil ecosystems (Damayanti, 2021). However, unfortunately, Indonesian people, especially housewives, do not pay enough attention to this matter, as evidenced by the presence of puddles of oil in several drainage channels.

In other cases, the use of petroleum as vehicle fuel has increased rapidly along with the widespread use of private and public transportation. Indonesia currently still depends on the availability of energy sources using fossil-based fuels. Data obtained by the Department of Energy and Mineral Resources shows that with crude oil supplies in Indonesia of around 9 billion barrels, and with average production of 500 million barrels per year, this supply will run out in 18 years. One way to reduce dependence on petroleum and meet global environmental needs is to develop environmentally friendly alternative fuels. Demand related to the availability of fuel oil has increased, because in 2019 it is estimated that diesel fuel use in Indonesia will reach around 34.12 billion liters and this figure will continue to increase every year.

Considering the large amount of used cooking oil waste from industry and households, as well as the high consumption of petroleum, a solution is needed in the form of recycling technology for used cooking oil into a positive value product, namely biodiesel, which can overcome these two problems. Processing used cooking oil into biodiesel products requires the development of innovative technology in the form of Green Technology KIT.

This research aims to produce used cooking oil waste processing technology that is environmentally friendly and suitable for application in everyday life. This green technology does not only focus on biodiesel production, but aims to reduce environmental pollution due to used cooking oil. Green Technology KIT aims to support and make sustainable development a success in every region, even throughout Indonesia.

Materials and Methods

This type of research is research and development, namely research to produce a product. The product produced is Green Technology KIT, which is a set of tools and materials that connect scientific (biological) concepts with environmental science.

Procedure

This research and development step uses the Borg & Gall development model (Borg, W.R. & Gall, 2003). R&D is a process used to develop and validate educational products. The steps in this process are generally known as the R & D cycle, which consists of: reviewing the results of previous research relating to the validity of the components of the product to be developed, developing it into a product, testing the designed product, and reviewing and correcting the product based on test results. This is an indication that the findings from the development activities carried out have objectivity (Borg, W.R. & Gall, 2003). The reason for choosing this model is based on systematic and sequential steps and is quite clear in explaining each step.

The location of this research is Getaspejaten Village, Jati, Kudus, Central Java, Indonesia. The research subjects who are the data source are residents of Getaspejaten village who are also the population of this research. Determining the sample in this study used a random sampling technique, consisting of twenty residents who were randomly selected from the research population, namely Getaspejaten Village, Jati, Kudus, Central Java, Indonesia. The data in this research includes data from the results of filling out a questionnaire with the help of Google form regarding the feasibility of this GT KIT, apart from that, this research data also includes validation results from the validator, namely the Tadris Biology lecturer at IAIN Kudus.

Data analysis

In developing a learning media, several criteria for media suitability are required. Media eligibility criteria refer to a combination (Kustandi, 2011), (Wahono, 2006), and (BSNP 2008). Data collection was carried out using a product suitability assessment questionnaire sheet with the help of Google forms. After trying to use the environmentally friendly technology KIT developed by researchers, respondents were asked to fill out a questionnaire with several question instruments to assess the suitability of the product developed based on Edy Priyono's criteria (Edy Priyono, 2012). Apart from that, researchers also

collected data from respondents regarding input on this series of environmentally friendly technologies. Data analysis was carried out using the Rasch Model assisted by the Ministep application. Research data analysis was carried out by looking at the Unidimensionality table, namely by looking at the raw variance value explained by the feasibility measure referring to the explanation in table 2 in the results and discussion section in this article, namely the Raw variance table explained by measures criteria.

Results and Discussion

This development research procedure refers to the ten R&D procedural steps of the Borg & Gall model. Borg and Gall (2003) propose a series of stages that must be taken in this research, namely 1) Research and information collecting, 2) Planning, 3) Develop preliminary form of product, 4) Preliminary field testing, 5) Main product revision, 6) Main field testing, 7) Operational product revision, 8) Operational field testing, 9) Final product revision, and 10) Dissemination and implementation". These ten steps were then adapted and modified into five steps due to time, cost and energy limitations. The five steps are as follows: 1) Research and Information Collecting, 2) Develop preliminary form of product, 3) Main field testing, 4) Final product revision, and 5) Dissemination and implementation.

These five steps are the result of modifications due to several limitations. However, limitations can be overcome by field trials and product revisions obtained through demonstrations of the Green Technology KIT product to the Getaspejaten village community in the meeting hall which was attended by a number of young people and housewives who use cooking oil.

Several stages in this research are as follows:

1) Research and Information Collecting

The implementation of this preliminary study was carried out by researchers assisted by a team of field assistants by conducting a literature review regarding the importance of using technology in the era of society 5.0 to maintain a green environment from waste, reduce waste production,

reduce petroleum consumption and how used cooking oil waste should be processed using technology, so that there is no contamination accompanied by arguments. As previously explained, palm oil consumption in Indonesia is quite high every year. Referring to data from the Ministry of Industry, domestic palm oil consumption has increased over the last six years. In 2017, domestic palm oil consumption reached 11 million tons. Consumption continues to increase, in 2018 palm oil consumption was 13.4 million tonnes, then increased to 16.7 million tonnes in 2019, increased again to 17.3 million tonnes in 2020, then increased to 18.4 million tonnes in 2021, until 2022, palm oil consumption increased to 20.9 million tons. Based on that much domestic palm oil consumption, it certainly produces quite a lot of residue or processing waste. Gita Septyanti (2016), stated that cooking oil waste generated from domestic consumption of palm cooking oil amounted to 3.8 million tons in that year. If this is linked to studies which state that consumption of palm cooking oil increases every year, the used cooking oil produced has also increased. With such large amounts of used cooking oil spread across Indonesia, it can cause environmental pollution.

At this stage the researchers analyzed the potential pollution of used cooking oil waste in the environment referring to or in accordance with the attached data and the average consumption of palm oil and the potential for used cooking oil produced on the Central Bureau of Statistics website in 2022. Not only related to palm oil consumption, the potential for it to decrease The availability of diesel oil in the next few years is also a preliminary study in developing this product. Researchers obtained study results that consumed diesel oil.

2) Develop Preliminary Form of Product

At this stage the researcher was assisted by a team of field assistants to determine the necessary supporting data and prepare a set of used cooking oil processing technologies. The researcher made a plan to design a green technology product that would be developed, namely the Green Technology KIT product, starting from its appearance, the barcode of the materials, and a set of material tools inside. During the production

process, researchers coordinate, check and monitor the progress of product creation.

The appearance of the 'Green Technology KIT' product is as follows:



Figure 1. Product display of 'Green Technology KIT'

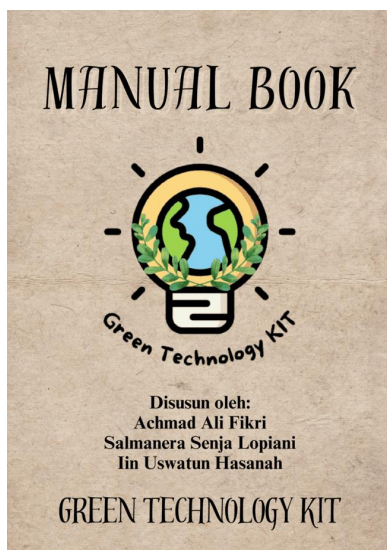


Figure 2. Display manual book of the 'Green Technology KIT'



Figure 3. Display of the 'Green Technology KIT' product along with a set of materials.



Figure 4. The barcode display contains important information related to the ingredients in the 'Green Technology KIT' product

At this stage, after the product has been successfully developed, the next step is for researchers to carry out product validation tests. Product validation tests are carried out by filling out an assessment questionnaire https://docs.google.com/forms/d/e/1FAIpQLSfsRniiAj7d_IPgb8AI-pv8vTZhqwR3rGl_dm5z6TQ3Yvcyw/viewform?usp=sf_link which consists of 2 aspects, namely; technological aspects of product design and product usability aspects. These two aspects are explained in 11 statements.

3) Main Field Testing.

At this stage the researcher was assisted by a team of field assistants who carried out trials using the 'Green Technology KIT' product with research subjects in the meeting hall by means of demonstrations and gave several subjects the opportunity to process biodiesel using this 'Green Technology KIT'. After the event was over, the researcher distributed the GForm link to the main field trial questionnaire sheet to the research subjects, namely several residents of Getaspejaten village, Jati sub-district, Kudus district. Following are the results of the main field trials which have been analyzed using the Rasch model.

Table 1. Unidimensionalitas

Table of STANDARDIZED RESIDUAL variance (in Eigenvalue units)			
		-- Empirical --	Modeled
Total raw variance in observations	=	18.8 100.0%	100.0%
Raw variance explained by measures	=	6.8 36.0%	33.2%
Raw variance explained by persons	=	3.3 17.4%	16.0%
Raw Variance explained by items	=	3.5 18.6%	17.2%
Raw unexplained variance (total)	=	12.0 64.0%	66.8%
Unexplned variance in 1st contrast	=	3.1 16.4%	25.7%
Unexplned variance in 2nd contrast	=	2.3 12.1%	19.0%
Unexplned variance in 3rd contrast	=	2.1 11.0%	17.1%
Unexplned variance in 4th contrast	=	1.5 8.1%	12.6%
Unexplned variance in 5th contrast	=	1.3 7.1%	11.1%

The results show that the Raw variance in observations is 36% where this category can be fulfilled.

Table 2. Raw variance explained by measures criteria

Score	Description
<20%	Tidak Terpenuhi
>20%	Terpenuhi
>40%	Baik
>60%	Sangat Baik

Based on the raw variance table explained by the measurement criteria above, it can be seen that the raw variance value explained by the measurements is 36%, which means it can be fulfilled, meaning that the feasibility requirements for the environmentally friendly technology products being developed can be met and almost touch the good requirements for product feasibility (Sumintono, B., & Widhiarso, W: 2014).

At this stage the validator provides assessments and also suggestions regarding product development. Some notes and input for the application are as follows: a) the process of using the product is still unclear, it is recommended to make a video tutorial and then present it in barcode form for easy access. b) The process of separating water and biodiesel oil is a little complicated. c) Processing by-products in the form of glycerol fatty acids must also be processed so that they do not become residue.

4) Final Product Revision

After receiving notes and input from respondents, researchers and the team then coordinated to revise and perfect the product that had been developed. The revisions made are minor revisions related to usability aspects to make it more attractive and easier to use. Researchers developed an AI chatbot called 'GT KIT BOT' with the help of the Zapier application as a question and answer service on usage and other information regarding the Green Technology KIT that is being developed. This technology can be used as a virtual assistant

for researchers using Green Technology KIT via chat messages (Benedict, 2017). Users can interact with researchers at any time via chat and can save time for Green Technology KIT users who feel confused and want to get information (Seo, 2021). 'GT KIT BOT' will provide information that is relevant to the user's question so that there is no need to wait long to get an answer from the researcher.

Before 'GT KIT BOT' was distributed to the public, especially for Green Technology KIT users, researchers had conducted experiments to measure the success of using 'GT KIT BOT'.

Attached are the results of the 'GT KIT BOT' experiment.

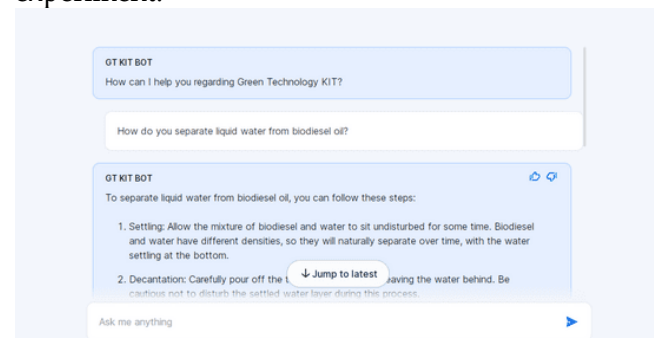


Figure 5. Display of the response from 'GT KIT BOT' to the questions submitted. response answers are very fast and complete. the level of accuracy of answers is quite high.

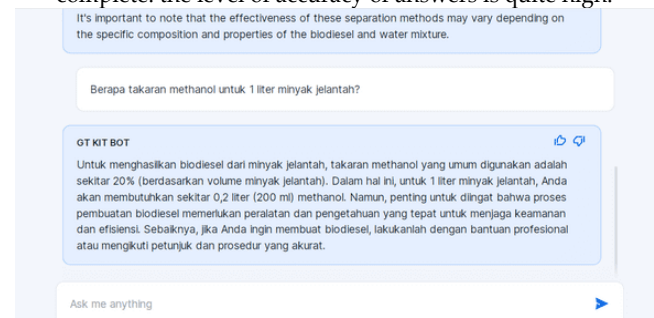


Figure 6. Display of responses from 'GT KIT BOT' to questions in Indonesian and more specifically regarding the use of Green Technology KIT.

Based on the results of experiments using AI technology in the form of 'GT KIT BOT', researchers found that the responses given by the AI 'GT KIT BOT' were very fast and satisfying, the responses were also relevant to what was asked. The resulting answers can answer difficulties or problems that may arise later. The 'GT KIT BOT' service can be accessed via the following link <https://chat-app-3add98.zapier.app>

5) Dissemination and implementation.

After developing the AI technology 'GT KIT BOT' as a form of final revision so that Green Technology KIT users can easily get answers to the difficulties they face, researchers carried out outreach. Temporary outreach was carried out with an explanation of the use of the 'Green Technology KIT' product and outreach regarding the dangers of carelessly disposing of used cooking oil waste into the environment and information regarding petroleum reserves which are increasingly depleting in line with the high consumption of diesel fuel. For widespread application in the future, this product will be disseminated to waste disposal institutions and other institutions such as village halls and waste management institutions such as InSWA so that it can be used and utilized by the entire community to manage the cooking oil waste produced so that it can minimize environmental pollution and ultimately produce a valuable product in the form of biodiesel that can be traded so that it can increase fund income as well.

Conclusions

This research produces a green technology device in the form of a Green Technology KIT which is suitable for use by anyone to process used cooking oil waste to reduce environmental pollution and reduce consumption of non-renewable petroleum resources. Step by step it has proceeded according to the flow, referring to the research stages that have been determined, namely the ten R&D procedural steps from the Borg & Gall model (Borg, W.R. & Gall, 2003) which were adapted and modified into five steps and can be accounted for. In the future, this research can be further developed with waste management institutions such as InSWA so that it can be used and utilized by the entire wider community.

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Mapping the Evolution of Ethical Dimension on Artificial Intelligence Research through Co-word Analysis

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Abstract: Artificial Intelligence (AI) has experienced very rapid development in the last few decades. Apart from that, AI has and will change many aspects of human life. However, as AI technology continues to develop, questions arise in the ethical dimension related to how ethically we as humans interact in utilizing or using Artificial Intelligence (AI). Therefore, this research aims to explore the extent to which research related to ethical dimensions in relation to the use of AI has been carried out. This research will use a bibliometric approach, specifically in Co-word analysis to identify core research themes and trends related to ethical dimensions in the use of Artificial Intelligence (AI). The results of this research are: 1) the research on the ethical dimension in AI has been massively discussed. It can be seen from the total number of occurrences of the words "artificial intelligence" and "ethics" that reach 1608 and 1223 times. 2) there are 4 clusters where each cluster consists of 155, 28, 19 and 19 keywords. The biggest keyword is "artificial intelligence" with 1608 total accuracy and 3964 link strength, followed by the word "ethic" with 1223 total accuracy and 3180 total accuracy 3) in the Evolution of the words Artificial Intelligence and the word Ethics are still often mentioned to this day and have given rise to other words related to the two such as the words AI ethics, Ethics of AI, Machine Ethics, artificial Intelligence ethics etc. 4) the words "information technology" and "decision-making" which are in the Niche themes quadrant on the thematic map graphic indicate that although this theme has experienced an increase in interest, not much research has been conducted regarding this theme.

Keywords: Monitoring AI Ethics through Co-word Analysis

Introduction

Artificial intelligence (AI) has become one of the most dynamic and significant areas of research in the last decade. Tremendous advances in computing technology, especially in data processing and storage, have become a very strong basis for the development of AI in terms of developing more sophisticated algorithms and more effective machine learning methods (Rios-Campos et al., 2023). Rapid developments in computing technology are key drivers of AI advancement. Advances in artificial intelligence have enabled AI systems to understand and respond to unstructured data, such as images and human language. This has opened up new opportunities in a variety of industries, from

healthcare to transportation, even business to education.

However, along with this rapid growth comes a very important ethical issue related to the use of AI in various aspects of our lives. Advances in AI technology have raised serious issues of privacy, fairness, and social impact. (Galaz et al., 2021). There are concerns related to how personal data is used and exchanged even in cyberspace, to obtain Big Data to perform further data analysis or the risk of deliberate manipulation of existing data (Chu et al., 2020). In addition, there are concerns that AI algorithms can become a source of bias and discrimination if not managed wisely (Al-Tkhayneh et al., 2023) even The development of AI for autonomous weapons can increase the risk of genocide and mass murder in certain groups.(Poghosyan, 2020).

Decisions taken by AI systems can also have significant consequences on society, including in terms of unemployment due to automation of human jobs. It is undeniable that AI advancements have had a significant impact on almost all sectors, from healthcare to transportation, and from business to education. Although AI has brought many tremendous benefits and potentials, rapid advances in artificial intelligence (AI) have also raised concerns about potential risks. This risk can be categorized into several areas. First, there is the risk of malicious use, where individuals or groups intentionally use AI to cause harm. Second, there is the risk of an AI race, where the competitive environment could lead to insecure deployment of AI or handover of control to AI (Hendrycks et al., 2023). Third, there is organizational risk, which highlights how human factors and complex systems can increase the likelihood of catastrophic accidents. (Gündoğar & Niauronis, 2023). Finally, there is the risk of rogue AI, which refers to the difficulty in controlling agents much more intelligent than humans (Al-Tkhayneh et al., 2023). These risks include social, security, safety, and ethical challenges (Passas et al., 2022). Ethical issues also grow with the development of AI; a lack of control and regulation over AI technology can lead to large-scale risks and non-compliance with moral norms. There are concerns related to privacy, algorithm discrimination, and the potential social harm that AI decisions can cause. Because of some of the above, researchers feel it is important to consider the ethical dimension in AI development and identify solutions that can overcome both the various problems that have occurred and the possible problems that will occur in the future. (Huang et al., 2022).

Co-word analysis is a valuable research tool that aids in comprehending the evolution and ethical trends within the scientific literature associated with AI. It enables the identification and detailed exploration of key words such as 'Ethics' in AI research that commonly co-occur in metadata. This method assists in uncovering the links and relationships between ethics and other interrelated concepts in artificial intelligence, such as 'data processing,' 'privacy,' 'machine learning,' and

more. Furthermore, Co-word analysis facilitates the examination of changes and advancements in the concept of ethics within AI research literature, highlighting emerging topics in recent years. This approach enables the identification of significant trends and focal points in ethical discussions related to AI, including the mapping of clusters or groups of concepts linked to AI ethics. Consequently, researchers can identify themes or associated terms close to 'ethics' that require further exploration in future research endeavors. Enhancing our understanding of these ethical issues allows for a more responsible utilization of AI technology, thereby minimizing its adverse impacts on society. Given this description, researchers are keen on assessing the extent and scope of research pertaining to ethical dimensions in the utilization of AI. This research aims to employ bibliometric methods, particularly Co-word analysis, to unveil core research themes and trends concerning ethical dimensions in AI utilization.

Materials and Methods

Research method

This study used a bibliometric approach by utilizing co-word analysis. The co-word analysis method is based on the assumption that keywords in a paper or article adequately reflect or represent the content of its content. Diodato argues that co-word analysis is rooted in the analysis of the co-occurrence (co-occurrence) of two or more keywords in the text used to index articles or other documents. (Tupan, 2016: 107). Co-word analysis aims to explore content, patterns, and trends in a group of documents by measuring the strength of relationships between specific terms or keywords (De Looze & Lemarie, 1997: 271).

Data collection

Data collection is carried out by extracting the metadata of scientific articles contained in international journals that have been indexed by Scopus by typing the search keywords "ethics" and "artificial intelligence" and filtering searches based on keywords on the Scopus website. From the search, researchers found 2,937 documents

consisting of 1408 articles, 665 conference papers, 364 reviews, 129 notes, 120 editorials, 112 book chapters, 81 letters, 27 books, 27 short surveys, and 3 conference reviews. Some of these documents have been published, from the oldest in 1985 to the one that will be officially published in 2025.

Data Analysis

After extracting the metadata into CSV format, the researcher then checks the metadata that has been collected to ensure that there is no incomplete or repeated data. Next, the metadata will be processed using the Biblioshiny application based web browser from Bibliomatrix. While Bibliomatrix is a package in the R program that can be used to analyze various analytical methods needed to carry out bibliometric studies, one of which is Co-Word Analysis. Apart from that, to get a broader picture, researchers also used VosViewer software to get visualization results from the evolution of the ethical dimension in Artificial Intelligence in this research.

Results and Discussion

In general, co-word analysis is based on observing the co-occurrence of two or more keywords or words in indexing text for other publications or documents. Co-word analysis could therefore be applied to many documents. These may be keywords or words from the text itself. To describe the dynamics of knowledge, the co-word analysis method was initially presented. Utilizing measuring methods to assess the power of information in today's scientific society is a typical strategy utilized to comprehend the progress of knowledge. In co-word analysis, "actor network" is a framework for describing knowledge dynamics.(Budiman, 2012)

The main premise of co-word analysis is that keywords extracted from an article can indicate the direction of research, the research topic, or a particular field. When two keywords appear together in an article, it suggests that their respective subjects are linked. The greater co-occurrence of the two terms shows a stronger association between them, which further

demonstrates their significance to a specific research topic.(Cambrosio et al., 1993) Co-word analysis is a subset of Bibliometric analysis (Amin et al., 2023) It offers advantages over co-citation and co-author analysis by identifying linkages between subjects in a specific field of research, following the scientific development of a field, and disclosing knowledge in a specific field(Bai & Li, 2022).

Co-Word analysis takes into account the occurrence of keywords aiming to identify groups of related keywords (Mangalaraj et al., 2023). This quantitative technique helps in understanding the complex relationships between sub-disciplines and finding relationships between them, thus tracing the development of those disciplines (He, 1999). This enables the mapping of correlations between thoughts and ideas discovered by a small number of specialists, such as in bibliometrics. Co-word analysis has been utilized to find underlying study themes and intellectual structures across numerous disciplines or research domains, including Internet of Things.(Misra et al., 2016), information retrieval research (Ding et al., 2001) and SOX-IS research (Mangalaraj et al., 2023).

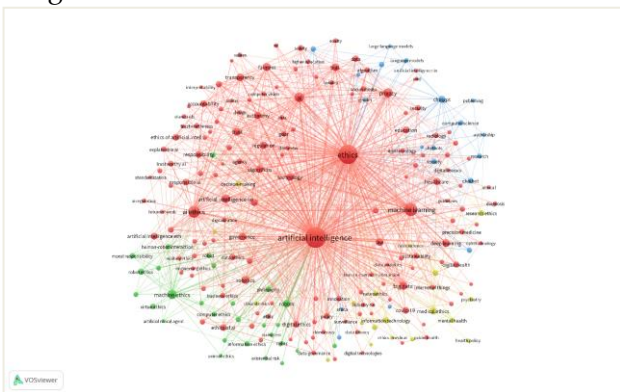
Cluster analysis

Co-word analysis in this study was carried out using the help of Vos Viewer and Biblioshiny software, as mentioned earlier in the research method, after the metadata was successfully extracted into CSV format, then the researcher checked the data for further processing to conduct various analyses. Among them is cluster analysis which can be observed through Co-Accurance analysis by identifying the extent to which two or more keywords or concepts appear together in a text or scientific literature.

Based on hierarchical cluster analysis, a group of closely related terms might reflect the research topic. In hierarchical cluster analysis, keyword classes are created by continually merging the most similar pairs of keywords and quantifying the degree of link between keywords by computing similarities and dissimilarities between target keywords. The keyword pairs were then integrated using a clustering algorithm to analyze similarities or dissimilarities between keywords based on their

connection relationships and to provide a list of all keywords in the research group ordered by similarity. This approach can handle nonlinear data and is applicable to the analysis of binary, categorical, and data with multiple zero-valued dimensions.(Beals, 1984).

In figure 1 below, we can see the size and relationship of each cluster that symbolizes each keyword in relation to one another, as well as how each cluster's hue represents a portion of that cluster. As seen in the image above, there are four clusters that may be recognized by four different hues. The first cluster is a red cluster with 155 terms that appears to dominate the other clusters. In addition, the second cluster is green and contains 28 terms. This cluster is comprised of 19 keywords and comprises of blue distributed at the top and at the bottom. Lastly, the fourth cluster is a yellow cluster positioned at the bottom of the image that contains 19 terms.



Gambar 1. Co-Accurance by Network Visualisation

the first cluster there are a number of keywords that dominate the discussion and the relationship between keywords is interrelated. "Artificial Intelligence" is the most dominating keyword, with 1608 occurrences, and has the highest "link strength" value of 3964. In addition, ethical issues are also a major concern, which is reflected in the keyword "ethics" with 1223 occurrences and a "link strength" value of 3180. Machine learning is also an important aspect of the discussion, albeit with a lower incidence rate, and has a link strength score of 973. AI ethics also emerged strongly, with 243 appearances and a link strength score of 506.

The 2nd Cluster some crucial keywords that appear are the words ethics, machines and robotics which are associated with ethical issues. "Machine

Ethics" was the most prominent keyword in the cluster, appearing 105 times with a "link strength" value of 245. This reflects that ethics related to machines and artificial intelligence are major concerns in the literature analyzed. "Robots" is another important keyword with 53 occurrences and 172 link strengths, suggesting that robotics is also becoming a significant issue in the context of machine ethics. In addition, there are keywords related to philosophical aspects such as "philosophy," "consciousness," and "morality," which have link strength values that describe the extent to which these keywords are related in the literature. All of this data provides a strong overview of the research focus and network of relationships between keywords in this cluster, with particular emphasis on ethical and robotics issues.

Furthermore, in 3rd Cluster, a number of keywords appeared that reflected the dominant topics in the literature analyzed. "ChatGPT" is the dominating keyword with 49 appearances and has the highest "link strength" value of 157. This indicates that ChatGPT, perhaps in the context of its use or development, is the center of attention in this cluster. In addition, the keywords "Justice" and "Chatbot" also have a fairly high occurrence, with the value of "link strength" describing strong relationships in literature. The cluster appears to be concerned with topics such as Natural Language Processing, Health Care Health Care, Society Society, Computer Science Computer Science, as well as social aspects such as gender. Overall, these data provide an overview of the diverse topics emerging in this cluster, focusing on ChatGPT and related topics that reflect the network of relationships in the study.

Finally, the 4th Cluster, this cluster highlights a number of keywords related to medical ethics and issues surrounding decision making, as well as topics related to mental health. "Medical Ethics" is the dominating keyword with 47 occurrences and has the highest link strength score of 130. This suggests that medical ethics is a key focus in this cluster. In addition, the keywords "Bioethics," "Decision-Making," and "Research Ethics" also appear with significant frequency, with "link strength" values reflecting strong relationships in

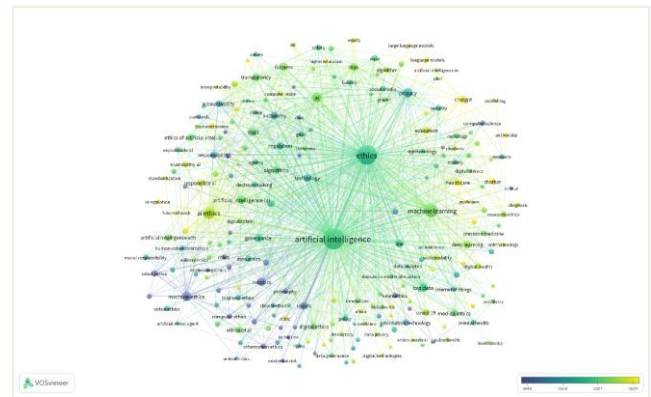
the literature. The cluster appears to deal with issues such as medical ethics, bioethics, decision-making, research ethics, as well as topics in mental health, psychiatry, and psychology. Overall, these data provide an overview of the important topics in this cluster, with an emphasis on medical ethics and related topics.

Tabel 1. 10 top Keywords each cluster

	no	10 keyword teratas	Total occurrences	link strength
1 st Cluster 155 Keyword	1	artificial intelligence	1608	3964
	2	ethics	1223	3180
	3	machine learning	313	973
	4	ai ethics	243	506
	5	ai	124	446
	6	privacy	105	428
	7	big data	75	260
	8	fairness	63	246
	9	machine ethics	105	245
	10	robotics	67	236
2 nd Cluster 28 Keyword	1	machine ethics	105	245
	2	robots	53	172
	3	philosophy	20	73
	4	consciousness	21	69
	5	autonomous systems	20	68
	6	robot ethics	28	66
	7	moral responsibility	17	51
	8	morality	16	51
	9	human-robot interaction	14	50
	10	moral agency	15	49
3 rd Cluster 19 Keyword	1	chatgpt	49	157
	2	justice	18	67
	3	chatbot	17	65
	4	natural language processing	21	61
	5	health care	18	56
	6	society	18	55
	7	research	14	46
	8	chatbots	12	42
	9	computer science	18	37
	10	gender	9	34
4 th Cluster 19 Keyword	1	medical ethics	47	130
	2	bioethics	25	77
	3	decision-making	25	74
	4	research ethics	26	63
	5	mental health	17	53
	6	information technology	28	50
	7	decision making	18	48
	8	psychiatry	13	46
	9	neuroethics	17	45
	10	psychology	8	40

It can be seen in Table 1 above that the top 10 keywords are in each cluster, where total occurrence refers to the frequency of occurrence of a keyword in the literature or dataset analyzed. It gives an idea of how often the keyword is used in general in research or literature. The higher the total occurrence of a keyword, the more important or general the keyword is in the field of study concerned (Ding et al., 2001). While the link strength measures the degree to which two terms are related in a research setting. This value indicates the frequency with which two keywords

appear in the same document or piece of literature. The greater the strength of the connection between two keywords, the closer their association in literature or study. Link strength analysis identifies correlations and connections between concepts or themes in the analyzed field of study, which can show significant academic trends, possible collaborations, or knowledge networks (Guo et al.,



2017).

Gambar 2. Co-Accurance by Overly Visualisation

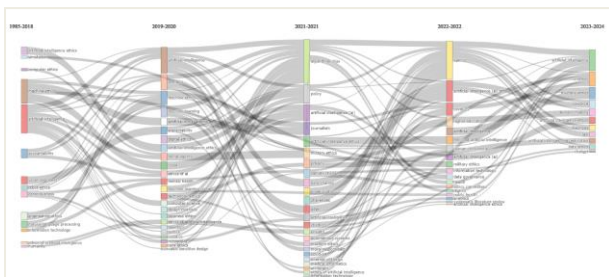
Figure 2 depicts co-accuracy when viewed from above, as well as the uniqueness of research from 2019 to 2022. The dark blue area suggests that the study topic or phrase has been around since 2019, whilst the lightening towards bright yellow shows that the topic or keyword has only recently begun to be utilized in the final years. Since 2019, ethical challenges in technology have been the subject of discussion, as seen in Figure 6. Even if the term "machine ethics" or "computer ethics" is still used in conjunction with the development of artificial intelligence, the terms "artificial intelligence" and "ethics" began to be used extensively beginning in 2021, and by 2022, the term "AI ethics" was coined.

Word Cloud and Tree Map

After doing an analysis with VosViewer, the researcher attempted to study the sorted metadata with Biblioshiny, a web browser-based program from Bibliomatrix, a package from Program R designed for bibliometric, infometrics or scientometrics.

research relates to the dimensions of ethics and artificial intelligence in literature or research. In the picture of the Three Field Plots above, it can be seen that the US, UK, and Germany are ranked in the top 3 for carrying out research related to the dimensions of ethics and artificial intelligence, while institutions that conduct research related to similar themes are occupied by the University of Oxford, the University Medical Center Utrecht, and the University of Cambridge. The keywords generated are mostly still using the words artificial intelligence and ethics, followed by machine learning and new words that emerged from combining acronyms and the previously popular word AI ethics. By using the Three Field Plot in co-word analysis, we can understand the dynamics and relationships between institutions, countries, and keywords generated in particular research metadata. It is useful for identifying potential collaborations, research trends, and geographical influences in the academic literature.

Knowledge Evolution Analysis



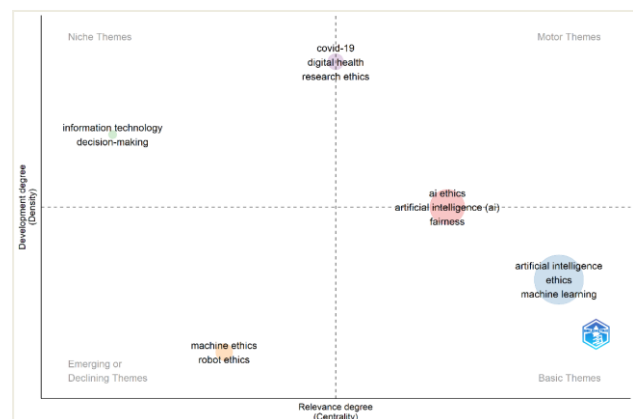
Gambar 1. Thematic Evolution

To find out how the evolution of words formed from year to year, we can look at the picture above, where each word that appears is the result of words taken based on keywords in the results of the co-occurrence analysis over a certain period of years. Each segment reflects a key research topic within a given year period and describes the strongest interconnections between nodes in a co-occurrence network. The height of the segment indicates how much attention is paid to the topic based on the extent to which the nodes are connected within a given period of years. Channels connecting different segments in different years reflect the amount of co-occurrence between two segments and other nodes. Channel width

indicates how many research topics in a segment in the previous year had similar relationships with other topics as they progressed to other research the following year. (Leydesdorff & Goldstone, 2014) In the visualization of word evolution above, we can see that word changes in the word artificial intelligence simultaneously persist in experiencing many word mentions since the initial period of the word's formation. While the ethics of artificial intelligence continue to change from time to time, Furthermore, the words ethics and artificial intelligence ultimately continue to give birth to other words or terms and continue to change from period to period.

Tematik map

When co-word analysis is used to map science, groups of keywords (and the relationships between them) are generated. These groups are considered themes (Callon et al., 1991). Each cluster or theme can be represented on a specific plot called a strategic or thematic map (Cobo et al., 2011). Each research theme obtained in this process is then characterized by two parameters: "density" and "centrality" (Cahlik, 2000).



Gambar 2. Thematic Map

In the picture above, the blue circle containing the words artificial intelligence, ethics, and machine learning is on basic themes, which means that these words are quite popular today. While the word in the red circle, namely AI ethics, artificial intelligence (AI), and fairness, is between the quadrant of basic themes and motor themes, which indicates that even the theme is quite popular and is experiencing increased research,

Furthermore, the purple circle consisting of the words COVID-19, digital health, and research ethics is between the pieces Motor Themes and Niche Themes, which means that previously these themes have increased in number but now have begun to decrease and tend to no longer be researched. Furthermore, the green circle precisely in the word information technology and decision-making is in the niche themes quadrant, which indicates that although this theme has increased before, there is still not much research that discusses related to these keywords. Finally, the orange-colored circle with the keywords machine ethics and robot ethics has been in the Emerging or Declining Themes quadrant, which means that these themes have decreased interest. From the thematic map chart above, we can track the movement of research trends over time. This allows us to identify what research themes have been extensively researched to further determine priorities and focus on what research still needs to be studied and explored in more depth.

Conclusions

Based on the Co-word analysis that has been carried out, researchers conclude that research on the ethical dimension in AI has been massive, this can be seen from the total number of occurrences of the words "artificial intelligence" and "ethics" which were mentioned 1608 and 1223 times. Apart from that, these two words have even given rise to new words related to them and have quite a few mentions, namely around 243 times with a power of around 506 mentions. This indicates the urgency and further development of research on the ethical dimension in AI. Furthermore, in this research the researchers found that there were 4 clusters spread out, the first cluster was a red cluster consisting of 155 keywords, the 2nd cluster looked green and consisted of 28 keywords, the 3rd cluster was a blue cluster consisting of 19 keywords, finally the 4th cluster is the yellow cluster and consists of 19 keywords. In first place, the biggest keyword is "artificial intelligence" which dominates the most, with 1608 total accuracy appearances, and has the highest "link strength" value of 3964, followed by

the word "ethics" with 1223 total accuracy and "link" value. strength" as many as 3180, machine learning, ai ethics, ai, privacy, big data, fairness, machine ethics, robotics etc. From the word evolution graph, we can see that Artificial Intelligence and the word Ethics are still often mentioned in several literatures, and they even continue to give rise to new terms related to both. The researcher suggests that future researchers can carry out research related to the words "information technology" and "decision-making". As can be seen in the thematic map, both are in the Niche themes quadrant, which indicates that although this theme has experienced an increase previously, there is still not much research that discusses it. related to those keywords.

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The Effect of Spinach Leaves Powder (*Spinacia oleracea*) on the Quality of Dried Noodle

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Abstract: Vegetables are nutrient-dense foods that provide great health benefits to the consumers. However, vegetables are not always being consumed. Thus, there is a need in increasing the consumption of vegetables in the society. Noodle was used as the matrix in this case as it is a famous staple food. In this study, a total of five formulations of dried noodles incorporated with various amounts (2g, 4g, 6g, 8g and 10g) of spinach leaves powder were developed. F2, made up of 4g of spinach leaves powder was chosen to be the best formulation due to its most well-accepted sensory results and satisfying textural properties. This formulation showed an increased content of ash, protein, crude fibre, moisture and total chlorophyll content and a lower content of fat and carbohydrate than the control. From the aspect of cooking quality, it exhibited significantly lower ($p < 0.05$) cooking time, cooking loss and swelling index, but significantly higher cooking weight and water absorption than the control. After eight weeks of storage, the data collected showed that the product was still safe for consumption from the aspects of water activity (aw), moisture content and microbiological quality. No significant difference ($p < 0.05$) was observed in the texture properties, but a significant difference in terms of colour was observed during the storage. Overall, 4g of spinach leaves powder was considered suitable to be used in developing spinach noodle without deterioration to its overall quality and this formulation has the potency to be acceptable in society as an alternative healthier choice of noodles to ordinary commercialized dried noodles.

Keywords: spinach, dried noodles, proximate compositions, noodle quality, storage study.

Introduction

Due to modernity, eating patterns are shifting unfavourably, with poor diets and a lack of physical activity posing major health hazards on a global scale (WHO, 2020). Poor eating habits associated with low consumption of vegetables and fruits are often linked to the increased risk of non-communicable diseases such as heart disease, diabetes, obesity and some cancers (Wang et al., 2019). Therefore, lifestyle and diet intake should be modified in order to prevent and reduce the risks of these diseases. Despite having a high nutritional value and health benefits, vegetables are not often

consumed, especially by children and adolescents (Choong et al., 2017). It is found that the main barrier to the consumption of vegetables in the society, especially children is the unfavourable sensory elements of vegetables, including taste, colour, flavour, and texture that affect people's preferences and intake of vegetables (Kasprzak et al., 2020).

The effective strategy to the hurdle of low consumption pattern of vegetables and depleted nutrients in noodles is by developing a functional food product incorporated with vegetables (Micha et al., 2015). This can lead to the indirect ingestion of vegetables by children (Shere et al., 2020b).

Several studies show that children enjoy eating noodles, making the development of vegetable-based noodles a feasible one (Shere et al., 2018a). Additionally, this might attract children because of the attractive green colour of spinach noodle and encourage consumer of all age groups to increase their vegetable consumption in a convenient way (Choong et al., 2017; Aune et al., 2017).

For Asians, noodle is the primary source of energy and the most economical energy-dense food in preventing hunger (Zhang & Ma, 2016). Due to their ease in preparation, transportation, minimal cooking time, palatability, low cost, storage stability and nutritional characteristics, noodles are currently viewed as a quick and easy meal. (Ramu et al., 2018; Rathod & Annature, 2017). Till now, noodles remain as a staple food in Asian diets.

Spinach with the scientific name of *Spinacia oleracea* from the family Amaranthaceae was chosen in this study. Spinach is a highly nutritious vegetable as it provides a very good amount of dietary fiber, vitamins, minerals, phytonutrients and bioactive compounds which help to prevent chronic health problems (Salehi et al., 2019; Manzoor et al., 2020). Furthermore, the spinach leaves are turned into powder form for easier handling, storage and usability due to its volume and light weight (Ankita & Prasad, 2015a). Cabinet drying has been chosen as the drying method in this study as this drying method is more economical, easily controlled and gives similar effect as freeze drying (Hasan et al., 2019).

This study dominantly aimed to investigate the potential application of adding spinach leaves (*Spinacia oleracea*) in developing dried noodles by incorporating the spinach leaves in the form of powder into the noodles' formulations at various levels. The best-formulated sample was identified based on sensory evaluation and physicochemical properties and subsequently analyzed for its nutritional content, cooking quality and lastly, the changes of storage quality throughout the storage period. It is expected that noodles produced in this study have the potency to be a healthier alternative to the public who are getting more mindful of their food choices.

Materials and Methods

Materials

All ingredients used in this study were purchased from a local market in Kota Kinabalu, Sabah, Malaysia.

Preparation and analysis of noodle sample

Preparation of spinach powder

Spinach leaves were steam-blanching and dried in a cabinet dryer for 8 hours at 45°C. Dried spinach leaves were cooled and ground using a blender. Then, the spinach powder was transferred into a glass bottle and kept at 4°C (El-Sayed, 2020).

Noodle Preparation

50 g of whole egg was added into the mixture of ingredients, mixed for 5 min and followed by the addition of water to form a crumbly mass. After mixing and cohesive dough was formed, the dough was covered with plastic wrapper and left rested for 20 min. The dough then underwent repeated sheeting and lastly extruded through a die with 12 outlets of 0.8 mm in diameter. The noodles were cut into 20 cm long, steam-cooked for 5 min, followed by 5 hrs of drying at 65°C and finally inserted into polyethylene bags. The formulations of spinach noodles are listed in Table 2.1.

Table 2.1: Several formulations of spinach noodle by using different

Ingredients	F0	F1	F2	F3	F4	F5
Wheat Flour (g)	100	100	100	100	100	100
Spinach Powder (g)	-	2	4	6	8	10
Whole egg (g)	50	50	50	50	50	50
Water (g)	10	10	10	10	10	10
Salt (g)	1	1	1	1	1	1

Sensory Evaluation

All the formulations were served in soup during the sensory evaluation (Shere et al., 2018a). 9-point hedonic test was chosen and a total of 40 panelists from the Universiti Malaysia Sabah (UMS) were recruited. The attributes evaluated included colour, texture, taste, aroma, and overall acceptability.

Colour Analysis

Konica Minolta colour measurement system which was calibrated by using a white tile of barium sulphate that had 100% reflectance was used to evaluate the colour values of cooked and raw

noodles. The L^* , a^* , and b^* values were reflected. All measurements were done in triplicate.

Texture Profile Analysis

300 ml of water was used to cook 30 g of spinach noodles for 8 minutes, followed by draining and cooling in a sieve for 3 minutes. Noodle strands of not more than 75 mm length were used in texture profile analysis with the aid of Texture analyzer (TA-XT PLUS, Stable micro system limited). The test conditions used were as follows, pretest speed of 1mm/sec, test speed of 1mm/sec, post-test speed of 5mm/sec, 80% strain and 20 g trigger force (Shere et al., 2018b). The parameter evaluated included hardness, adhesiveness, springiness, cohesiveness, gumminess, and chewiness. For each formulation, the measurements were repeated 10 times.

Proximate Analysis

The proximate compositions which included moisture, ash, crude protein, crude fat, and crude fibre were analyzed by referring to AOAC (1990). The total carbohydrate content was obtained by subtracting the sum of other values from 100%.

Pigment Chlorophyll

2.5 g of sample was transferred into a 125 ml glass stoppered flask. 10 mL of 80% acetone was used to extract the chlorophyll of the 80-mesh spinach noodle for 10 minutes. This step was repeated and halted once the samples totally lost their greenness. Using a filter paper, the extract was filtered into an amber graduated flask. 80% acetone was added until the final volume became 25 ml. UV/VIS spectrophotometer was employed in measuring the chlorophyll extract's absorbance. The samples being analyzed were read at 645 nm and read again after the wavelength was reset to 663 nm. The formulae below were used to calculate the values of the total chlorophyll (T_c), chlorophyll a (C_a), and chlorophyll b (C_b) contents in the samples (Yu et al., 2019).

$$C_a \text{ (mg/L)} = 12.7D_{663} - 2.69D_{645}$$

$$C_b \text{ (mg/L)} = 22.9D_{645} - 4.68D_{663}$$

$$TC \text{ (mg/L)} = 20.21D_{645} + 8.02D_{663}$$

Cooking Quality

The cooking quality (optimum cooking time, cooking weight, cooking loss, and water absorption) were determined by referring to Method 66-50.01 from AACC. Swelling index was determined based on the method proposed by Cleary & Brennan (2006). Each attribute was then calculated using their respective formula as follows:

$$\text{Cooking weight (\%)} = \frac{\text{Weight of cooked noodles (g)}}{\text{Weight of noodles (g)}} \times 100\%$$

$$\text{Cooking loss (\%)} = \frac{\text{Dry matters in cooked water (g)}}{\text{Weight of noodles (g)}} \times 100\%$$

$$\begin{aligned} \text{Water absorption (\%)} \\ &= \frac{\text{Weight of cooked noodles (g)} - \text{Weight of noodle (g)}}{\text{Weight of noodles (g)}} \times 100\% \end{aligned}$$

$$\begin{aligned} \text{Swelling index (\%)} \\ &= \frac{\text{Weight of cooked noodles (g)} - \text{Weight of noodles after drying}}{\text{Weight of noodles after drying}} \times 100\% \end{aligned}$$

Storage Stability

Storage stability of the best formulation noodle was determined in polyethylene bags by keeping 100 g of noodles in 8 different bags for 8 weeks. Water activity, moisture content, colour analysis, texture profile analysis, and microbial analysis were determined every week. Water activity test was carried out by using HygroLab C1 Rotronic. Microbial analysis for bacteria, yeast and mould count was performed. 9 ml of sterile water was used to homogenize 1 g of sample. Serial dilution was performed up to 10^{-5} for both total plate count and yeast and mould count. Total plate count was performed on plate count agar and yeast and mould count on potato dextrose agar using pour plate technique.

Statistical Analysis

All the obtained data were subjected to statistical analysis to determine statistical significance of treatments. Data was expressed in the form of mean $\pm$ standard deviation. P value < 0.05 was considered significant. Sensory test, texture profile analysis, and storage stability test were subjected to One-Way ANOVA followed by post-hoc Tukey test. Proximate analyses, pigment chlorophyll, and cooking quality tests were subjected to Independent T Test. Data from colour analysis were subjected to Two-Way ANOVA.

Results and Discussion

Sensory Evaluation

Table 1. Sensory Evaluation of Dried Spinach Noodles

Formulation	Colour	Texture	Taste	Aroma	Overall Acceptability
F0	5.68 ^a	6.73 ^a	6.08 ^a	6.03 ^a	6.63 ^a
F1	6.33 ^a	7.03 ^a	6.43 ^a	6.35 ^a	7.23 ^a
F2	8.25 ^a	7.98 ^a	7.78 ^a	7.70 ^a	8.30 ^a
F3	7.03 ^a	6.95 ^a	6.75 ^a	6.68 ^a	7.38 ^a
F4	4.22 ^d	6.38 ^a	4.65 ^a	4.58 ^a	6.08 ^a
F5	3.63 ^d	5.48 ^c	4.60 ^a	4.45 ^a	4.72 ^c
F5		3.63 ^d		5.48 ^c	4.60 ^c

¹Values are expressed as mean, n=40.

²Values denoted by various superscripts differ significantly (p<0.05).

F2 obtained the highest mean score among all the formulations for all the attributes while F5 obtained the lowest mean score for all the attributes. This highest mean score obtained by F2 can be explained by the appropriate addition of spinach powder resulting in an eye-appealing green colour in the noodle which were well accepted by most of the panelist. The fact that F5 obtained the lowest mean score can be explained by the unattractive dark green colour, soft texture, and strong vegetable taste in the noodle which was perceived as undesirable by majority of the panelists as a result of excessively high concentration of spinach powder added into the noodle. Softness of the noodle can be linked with the high fiber content in spinach powder that has great affinity for water which reduced the availability of water for the formation of for gluten network (Shere et al., 2018b). Aroma showed similar trend as taste. The overall acceptability of F2 sample was higher than the control noodle. However further increase in the concentration resulted in a reduced overall acceptability.

Colour Analysis

Table 2. Colour Values (L*, a* and b*) of Different Formulation of Raw and Cooked Spinach Noodles

Sample	L*		a*		b*	
	Raw	Cooked	Raw	Cooked	Raw	Cooked
F0	66.11 ± 0.15a	68.57 ± 0.10a	2.55 ± 0.13a	1.48 ± 0.27a	22.79 ± 0.09a	15.61 ± 0.05
F1	51.74 ± 0.14b	54.45 ± 0.37b	-4.27 ± 0.08b	-7.10 ± 0.08b	16.24 ± 0.13b	23.87 ± 0.07
F2	42.24 ± 0.16c	48.38 ± 0.04c	-3.22 ± 0.23c	-6.83 ± 0.10c	11.69 ± 0.16c	22.69 ± 0.15
F3	41.60 ± 0.31d	46.56 ± 0.19d	-2.48 ± 0.10d	-5.25 ± 0.06d	7.58 ± 0.04d	20.49 ± 0.07
F4	37.64 ± 0.08e	42.76 ± 0.05e	-1.66 ± 0.03e	4.27 ± 0.08e	4.64 ± 0.25e	16.72 ± 0.18
F5	34.80 ± 0.04f	40.32 ± 0.17f	-0.89 ± 0.03f	-3.46 ± 0.09f	2.79 ± 0.04f	14.27 ± 0.10

¹Values are expressed as mean, n=40.

²Values denoted by various superscripts differ significantly (p<0.05).

There is a significant difference (p<0.05) in terms of L*, a*, and b* for all the formulations in both raw

and cooked noodle. The lowest brightness achieved by F5 in both raw and cooked noodle was due to the highest concentration of spinach powder added into the noodles which resulted in the production of noodles with the darkest green colour, therefore greatly reducing the brightness of the noodle. Generally, cooked noodle showed a higher L* value as compared to raw noodle for all formulations. The result is in line with the study by Rekha et al. (2013) where cooked spinach noodle showed higher brightness values as compared to raw spinach noodle. The increase L* value indicates the colour faded when it was being cooked (Yadav et al. 2014).

F1 to F5 showed a decreasing negative a* value trend in both raw and cooked noodle. The highest negative a* value of F1 indicates that F1 has the highest green shade while the lowest negative a* value of F5 indicates that it has the lowest green shade. The result aligns with the study by Rekha et al. (2013) where cooked spinach noodle showed higher greenness values than raw spinach noodle. The lowest green shade obtained by F5 can be explained by the highest incorporation of spinach powder. The higher b* values of cooked noodle from F1 to F5 than its corresponding raw form can be explained by the swelling of the noodle and conversion of pigments resulting in an increase in yellowness during cooking (Yadav et al., 2014). On the other hand, decreasing trend of positive b* values indicate a decreasing trend in the yellowness in both cooked and uncooked spinach noodle. This means that the colour of the noodles is contributed by the natural green colour of the spinach used (Shere et al., 2018a).

Texture Profile Analysis

Table 3. Textural Quality of Different Formulation of Cooked Spinach Noodles

Sample	Hardness (kg)	Adhesiveness (kg/sec)	Springiness (mm)	Cohesiveness	Gumminess (kg)	Chewiness (kg/mm)
F0	5.815±0.043 ^a	-0.008±0.001 ^a	3.781±0.058 ^a	0.860±0.004 ^a	4.994±0.059 ^a	18.880±0.07
F1	4.882±0.070 ^b	-0.013±0.001 ^b	1.033±0.006 ^b	0.821±0.002 ^b	4.008±0.067 ^b	4.140±0.07
F2	4.545±0.048 ^c	-0.027±0.003 ^c	0.948±0.008 ^c	0.765±0.001 ^c	3.477±0.041 ^c	3.297±0.06
F3	3.917±0.073 ^d	-0.058±0.001 ^d	0.875±0.006 ^d	0.672±0.002 ^d	2.634±0.044 ^d	2.304±0.02
F4	3.469±0.014 ^e	-0.064±0.002 ^e	0.846±0.008 ^e	0.605±0.002 ^e	2.100±0.008 ^e	1.777±0.015
F5	2.743±0.059 ^f	-0.073±0.001 ^f	0.767±0.013 ^f	0.563±0.006 ^f	1.544±0.048 ^f	1.183±0.04

¹Values denoted by various superscripts differ significantly (p<0.05).

From Table 3, there is a significant decrease in hardness, springiness, cohesiveness, gumminess, and chewiness. This can be attributed to the presence of fibers in spinach powder which have

high affinity for water (Shere et al., 2018b). This disturbed the gluten matrix and caused dilution of gluten which weakened the structure of noodle. Decrease in firmness values were also seen in the study by Rekha et al. (2013) by the incorporation of vegetable puree in pasta. However, significant increase in adhesiveness of noodle from F1 to F5 was reported and this can be attributed to the presence of high fiber content in spinach which has strong water absorption capability that contributed to a higher adhesiveness. F5 incorporated with the highest concentration of spinach powder showed the highest adhesiveness value as compared to all the other samples but it is an undesirable property.

Proximate Composition

Table 4. Proximate Compositions of Control and Best Formulation (F2)

Composition (%W/W)	Control	F2
Moisture	6.26 ± 0.02 ^a	8.21 ± 0.01 ^b
Ash	1.85 ± 0.01 ^a	3.33 ± 0.01 ^b
Crude Protein	13.28 ± 0.02 ^a	14.22 ± 0.01 ^b
Crude Fat	5.62 ± 0.01 ^a	5.46 ± 0.05 ^b
Crude Fiber	1.38 ± 0.02 ^a	8.69 ± 0.06 ^b
Total Carbohydrate	71.61 ± 0.03 ^a	60.09 ± 0.13 ^b

¹Values are expressed as mean, n=40.

²Values denoted by various superscripts differ significantly (p<0.05).

F2 recorded a significantly higher moisture content (p<0.05) than the control. The greater moisture content in F2 can be linked with the higher amount of fiber in the flour that can bind water well. Therefore, the water was bound by fiber, not lost but retained in fiber during drying (Shere et al., 2020b). The significantly higher (p<0.05) ash content of F2 than the control may be due to the presence of more minerals in the noodles through the incorporation of spinach powder (Shere et al., 2020b). A significantly higher protein content (p<0.05) was seen in F2 (14.22%) than the control (13.28%). This can be supported by the study from Waseem et al. (2021) which found that the nutritional status of the end-product was enhanced through the enrichment of nutrient-dense ingredients like vegetable powder in wheat flour. Fat content of control (5.62%) is significantly (p<0.05) higher than F2 (5.46%). This can be explained by the dilution of gluten caused by the spinach powder in the flour (Shere et al., 2020b).

Crude fiber content of F2 (8.69%) is significantly higher (p<0.05) than the control (1.38%). This can

be explained by the high fiber content present in the spinach. This result matches with the finding by Shere et al. (2018a) in which spinach noodle had a higher fiber content as compared to wheat flour noodle. Other than that, F2 contained a significantly lower (p<0.05) carbohydrate content (60.09%) as compared to the control (71.6%). This can be explained by the increase of other nutritional compositions in F2, such as moisture, ash, protein, and crude fiber content of the noodles. Since the carbohydrate content of wheat flour is higher, hence there is a necessity to incorporate spinach powder which contains lower carbohydrate content but rich in other nutrients.

Chlorophyll Pigment Analysis

Table 5. Chlorophyll Pigment Analysis of Control Sample and Best Formulation (F2)

Chlorophyll Content	Control	F2
Chlorophyll a (mg/L)	-0.003 ± 0.001 ^a	22.599 ± 0.026 ^b
Chlorophyll b (mg/L)	0.549 ± 0.000 ^a	2.077 ± 0.012 ^b
Total Chlorophyll (mg/L)	0.546 ± 0.000 ^a	24.675 ± 0.014 ^b

¹Values are expressed as mean, n=40.

²Values denoted by various superscripts differ significantly (p<0.05).

Based on the result shown in Table 5, F2 contained a much higher total chlorophyll content (24.68 mg/L) as compared to the control sample (0.55 mg/L). The trace amount of chlorophyll observed in control can be supported by residual amount of chlorophyll in wheat (16.82 mg/100g) as shown in the study from Niroula et al. (2019). The higher chlorophyll content present in F2 was because of the abundant chlorophyll pigments present in the spinach leaves. The result is in line with the study by Rekha et al. (2013) which showed that spinach noodle contained a higher chlorophyll content than its corresponding control sample. Besides, F2 contained a higher value of chlorophyll a (22.60 mg/L) than chlorophyll b (2.08 mg/L). This is because chlorophyll a is the most abundant type of pigment found in all photosynthetic plants. Chlorophyll a is the primary pigment of photosynthesis, while chlorophyll b plays a supporting role in photosynthesis.

Cooking Quality

Table 6. Cooking Quality of Control Sample and Best Formulation (F2)

Cooking Quality	Control	F2
Cooking Time (min)	6.45 ± 0.08 ^a	5.33 ± 0.06 ^b
Cooking Weight (g)	239.32 ± 0.05 ^a	246.52 ± 0.01 ^b
Cooking Loss (%)	13.70 ± 0.05 ^a	7.43 ± 0.13 ^b
Water Absorption (%)	148.88 ± 0.04 ^a	161.26 ± 0.10 ^b
Swelling Index (ml/g)	1.93 ± 0.03 ^a	1.85 ± 0.03 ^b

¹Values denoted by various superscripts differ significantly (p<0.05).

From Table 6, it is seen that a shorter cooking time was shown by F2 (5.33 min) as compared to the control (6.45 min). Therefore, this proves that cooking time is progressively reduced by the incorporation of spinach powder. Since gluten is primarily responsible in producing the starch or protein complex that dictates the structure and cooking characteristics of the noodles, the reduced cooking time can be explained by the dilution of gluten in dough by the addition of spinach powder (Rekha et al., 2013). Cooking weight and water absorption of control differed significantly (p<0.05) from F2, where a higher cooking weight (246.52 g) and water absorption (161.26%) were seen in F2 as compared to the control (239.32 g of cooking weight and 148.88% of water absorption). On the contrary, there is a significant difference (p<0.05) in terms of cooking loss between control and F2.

A lower cooking loss was seen in F2 (7.43%) as compared to the control (13.70%). Thus, this shows that the binding capacity of noodle strands cohesively can be enhanced by the addition of spinach powder in flour, which then contributed to a better binding of starch granules in gluten matrix (Rekha et al., 2013). Due to this cohesiveness, the loss of solids in cooking water was reduced (Shere et al., 2020b). Additionally, a significant difference (p<0.05) from the aspect of swelling index is also observed in these two formulations, where F2 showed a lower swelling index (1.85 ml/g) as compared to the control (1.93 ml/g). The starch components may have absorbed less water during the optimum cooking time, leading to reduced swelling indices, which can be explained by the rivalry between fibre and starch for water absorption. Therefore, increasing the amount of fibre led to less starch swelling, which in turn led to a lower swelling index.

Storage Stability

Water Activity and Moisture Content

Table 7. The Changes of Water Activity (A_w) and Moisture Content of the Best Formulation (F2) during Storage

Week	Water activity (A_w)	Moisture content (%)
0	0.354 ± 0.003 ^a	8.094 ± 0.001 ^a
1	0.355 ± 0.003 ^{ab}	8.094 ± 0.001 ^a
2	0.359 ± 0.006 ^{abc}	8.095 ± 0.001 ^{ab}
3	0.361 ± 0.003 ^{abcd}	8.096 ± 0.001 ^{abc}
4	0.366 ± 0.007 ^{abcde}	8.097 ± 0.001 ^{bc}
5	0.368 ± 0.004 ^{bcde}	8.099 ± 0.001 ^c
6	0.369 ± 0.004 ^{cde}	8.101 ± 0.001 ^d
7	0.374 ± 0.003 ^{de}	8.102 ± 0.001 ^{de}
8	0.377 ± 0.007 ^e	8.104 ± 0.000 ^e

¹Values are expressed as mean, n=40.

²Values denoted by various superscripts differ significantly (p<0.05).

Water activity (A_w) is important in determining the shelf life of food products. From the result in Table 3.7, the water activity increased from 0.35 on week 0 to 0.38 on week 8. This can be explained by the hygroscopic nature of the product, permeability of packaging used and the inconsistent surrounding environmental conditions, such as temperature and relative humidity (Jalgaonkar, 2017a). According to Sandulachi (2012) dried product should contain water activity less than 0.60, therefore the water activity of F2 is still within the acceptable range, and is still safe to eat.

Referring to Table 7, the moisture content of F2 increased from 8.09% on week 0 to 8.10% on week 8. The increment in moisture content from week 0 to 3 in F2 was not significant (p<0.05). This slight rise in the moisture content of the samples can be caused by the penetration of water vapour into the samples from the surrounding (changes in relative humidity and temperature) since the product is of hygroscopic nature (Gull et al., 2017; Jalgaonkar et al., 2017). 10% of moisture content is the maximum allowable limit of moisture content in foods as per the codex standards. Therefore, the moisture content of F2 is still within the acceptable limit.

Colour Profile

Table 8. The changes of Colour Values (L^* , a^* , b^*) of the Best Formulation (F2) during storage

Sample	L^*		a^*		b^*	
	Raw	Cooked	Raw	Cooked	Raw	Cooked
0	42.26 ± 0.12 ^a	48.38 ± 0.04 ^a	-3.09 ± 0.07 ^a	-6.83 ± 0.10 ^a	11.69 ± 0.16 ^a	22.69 ± 0.16 ^a
1	42.91 ± 0.18 ^b	48.74 ± 0.12 ^b	-3.23 ± 0.08 ^b	-7.10 ± 0.08 ^b	11.16 ± 0.06 ^b	22.08 ± 0.06 ^b
2	43.35 ± 0.03 ^c	49.05 ± 0.09 ^c	-3.36 ± 0.06 ^c	-7.27 ± 0.06 ^c	10.69 ± 0.06 ^c	21.88 ± 0.06 ^c
3	43.73 ± 0.05 ^d	49.42 ± 0.06 ^d	-3.46 ± 0.04 ^d	-7.89 ± 0.12 ^d	9.78 ± 0.07 ^d	21.23 ± 0.07 ^d
4	44.16 ± 0.05 ^e	49.84 ± 0.12 ^e	-3.81 ± 0.06 ^e	-8.12 ± 0.08 ^e	9.33 ± 0.08 ^e	20.64 ± 0.08 ^e
5	46.25 ± 0.08 ^f	51.23 ± 0.09 ^f	-4.08 ± 0.04 ^f	-8.52 ± 0.04 ^f	8.91 ± 0.03 ^f	19.90 ± 0.03 ^f
6	47.33 ± 0.02 ^g	52.36 ± 0.09 ^g	-4.38 ± 0.03 ^g	-8.74 ± 0.07 ^g	8.38 ± 0.07 ^g	18.78 ± 0.07 ^g
7	48.58 ± 0.04 ^h	54.87 ± 0.07 ^h	-4.48 ± 0.08 ^h	-9.05 ± 0.12 ^h	8.01 ± 0.08 ^h	17.25 ± 0.08 ^h
8	51.34 ± 0.12 ⁱ	56.09 ± 0.08 ⁱ	-4.83 ± 0.03 ⁱ	-9.35 ± 0.06 ⁱ	7.54 ± 0.04 ⁱ	16.72 ± 0.04 ⁱ

¹Values are expressed as mean, n=40.

²Values denoted by various superscripts differ significantly ($p < 0.05$).

From the result in Table 8, there is an increasing trend of brightness and greenness, but a decreasing trend is observed for yellowness in F2 noodle during the storage at ambient temperature for 8 weeks. The L^* values of raw noodle increased from 42.26 to 51.34 while the L^* values of the cooked noodle increased from 48.38 to 56.09. The a^* values of both raw and cooked spinach noodle increased from week 0 to week to week 8. This can be caused by the absorption of moisture by samples during storage. Oxidation also led to the loss of surface colour in samples during storage (Srinivasan & Prabhasankar, 2018). The effect of water absorption on color seems to be variable, but higher water absorption usually led to higher L^* values. Thus, the noodle become lighter (Morris et al., 2018). Besides, there is a decreasing trend in the b^* value of spinach noodle, where it decreased from week 0 (11.69) to week 8 (7.54) and the b^* value of cooked spinach noodle decreased from week 0 (22.69) to week 8 (16.72). This can be explained by the degradation of chlorophyll b and carotenoids.

Texture Profile

Table 9. Textural Changes of the Best Formulation (F2) during Storage

Sample	Hardness (kg)	Adhesiveness (kg/sec)	Springiness (mm)	Cohesiveness	Gumminess (kg)	Chewiness (kg/mm)
0	4.545±0.048 ^a	-0.027±0.003 ^b	0.948±0.008 ^a	0.765±0.001 ^a	3.477±0.041 ^a	3.297±0.062 ^a
1	4.545±0.004 ^a	-0.026±0.001 ^b	0.948±0.006 ^a	0.765±0.014 ^a	3.475±0.065 ^a	3.293±0.066 ^a
2	4.546±0.007 ^a	-0.026±0.000 ^b	0.948±0.003 ^a	0.764±0.009 ^a	3.472±0.039 ^a	3.302±0.042 ^a
3	4.547±0.005 ^a	-0.027±0.001 ^b	0.947±0.006 ^a	0.763±0.006 ^a	3.469±0.028 ^a	3.287±0.046 ^a
4	4.548±0.001 ^a	-0.029±0.002 ^b	0.946±0.010 ^a	0.765±0.003 ^a	3.481±0.014 ^a	3.293±0.046 ^a
5	4.549±0.007 ^a	-0.028±0.000 ^b	0.945±0.007 ^a	0.763±0.006 ^a	3.469±0.023 ^a	3.280±0.040 ^a
6	4.550±0.005 ^a	-0.028±0.001 ^b	0.945±0.007 ^a	0.763±0.003 ^a	3.476±0.023 ^a	3.279±0.041 ^a
7	4.551±0.002 ^a	0.028±0.003 ^a	0.944±0.002 ^a	0.762±0.004 ^a	3.473±0.023 ^a	3.277±0.033 ^a
8	4.551±0.003 ^a	-0.027±0.002 ^b	0.944±0.003 ^a	0.761±0.005 ^a	3.471±0.023 ^a	3.276±0.041 ^a

¹Values denoted by various superscripts differ significantly ($p < 0.05$).

From the result shown in Table 9, the hardness, adhesiveness, springiness, cohesiveness, gumminess, and chewiness of the spinach noodle

are not significantly influenced ($p > 0.05$) during storage period. Study from Jalgaonkar et al. (2017) and Gull et al. (2017) also showed that no significant difference was seen in the textural qualities of the noodles during storage period. Similar result was obtained by Yadav et al. (2014) which reported nonsignificant difference in hardness among vegetable-incorporated pasta.

Microbiological Quality

Table 10. Effect of Storage on the Microbiological Quality of the Spinach Noodles

Week	Total plate count (CFU/g)	Yeast and Mold Count (CFU/g)
0	2.0 × 10 ¹	1.0 × 10 ¹
1	4.0 × 10 ¹	2.0 × 10 ¹
2	8.0 × 10 ¹	3.0 × 10 ¹
3	2.2 × 10 ²	4.0 × 10 ¹
4	2.9 × 10 ²	4.0 × 10 ¹
5	3.6 × 10 ²	5.0 × 10 ¹
6	5.2 × 10 ²	7.0 × 10 ¹
7	7.5 × 10 ²	7.0 × 10 ¹
8	1.1 × 10 ³	9.0 × 10 ¹

The total plate count increased from 2.0 × 10¹ CFU/g to 1.1 × 10³ CFU/g over the storage period of 8 weeks. As the moisture content increased during the storage period, the total plate count of spinach noodles increased. However, the growth of yeast and mould count increased slightly from week 0 (1.0 × 10¹ CFU/g) to week 8 (9.0 × 10¹ CFU/g). According to FDA (2013), the permissible colony count for total plate count is 1.0 × 10³ CFU/g while the permissible colony count for yeast and mold count is 1.0 × 10⁵ CFU/g. According to Malaysian Food Law 1983 dan Food Regulation 1985, the allowable total plate count and yeast and mold count are not more than 10⁶. Therefore, the product was regarded safe to consume even after eight weeks of storage as the data did not surpass the maximum permissible limit. The slow growth of yeast and mold as compared to the bacteria may be explained by the suitable water activity level for the growth of yeast and mould is about 0.70 to 0.88.

Conclusions

The potential of incorporating spinach leaves powder into noodles was studied. F2 which contained 4 g of spinach leaves powder was the most acceptable formulation by the panelists and it obtained satisfying textural properties. As such, it

was picked as the best formulation. Such addition resulted in an increased ash, protein, crude fibre, moisture and total chlorophyll content and a lower content of fat and carbohydrate. Thus, it has the potency to be an alternative noodle to the consumers. In terms of cooking tests, F2 recorded a lower cooking time, cooking loss, swelling index, but a higher cooking weight and water absorption in comparison to the control. F2, being stored for 8 weeks was still regarded as safe for consumption from the aspects of moisture content, water activity and microbiological quality since all the data were within the safety range. There was no significant difference for all the parameters in the textural profile of F2. However, higher brightness, greenness, and lower yellowness were observed in the samples throughout the 8-week storage. Further study can be done to determine the antioxidant capacity and digestibility of noodles incorporated with spinach leaves powder. Also, potential of using spinach leaves in the other food products, such as bakery, confectionery and snack products can be explored, too. It is also suggested to include hydrocolloid in the formulations of noodles which can improve the cooking and textural qualities of noodles.

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The Potent of Constituents from Leunca Fruits (*Solanum nigrum* Linn.) as Anti-Skin Aging against TYRP-1: Molecular Docking and ADME-Tox

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Abstract: Leunca fruits are a source of natural antioxidants with compounds that have been reported, namely quercetin, solasodine, solanine, solamargine, and solasonine. However, its effectiveness as an anti-skin aging has not been studied. In the skin, melanin is produced by melanocytes in the deepest layer of the epidermis, thus protecting the skin from damage caused by sunlight radiation. Moreover, pregnant women can also cutaneous changes due to hyperpigmentation by skin lesions. If the formation of abnormal melanin, it is necessary to inhibit the tyrosinase enzyme, TYRP-1. This research was conducted by predicting the interaction between compounds of leunca fruits and the enzyme of TYRP-1 using Audock Tools 1.5.6. Then, from the molecular docking results, ADMET-Tox was carried out with pre-ADMET to determine transdermal drug delivery and safety when used as a product. The results of in silico molecular docking showed that solasodine and quercetin had a higher binding affinity (ΔG , -8.58 and -7.74 kcal/mol; K_i , 517.15 and 2110 nM) compared to kojic acid (-5.50 kcal/mol; 92720 nM) as a reference. The amino acid His192 becomes a crucial residue when hydrogen interacts based on visualization. While ADME-Tox, solasodine fulfills the safety of the transdermal route. Therefore, this compound can potentially be anti-skin aging from the leunca fruits. Apart from that as a drug topical for pregnant women when melanogenesis in the epidermal melanocytes.

Keywords: ADME-Tox, leunca, molecular docking, TYRP-1

Introduction

Aging is a degenerative process involving all the body's organs, including the skin. Skin aging is caused by physiological factors that are difficult to avoid (Xie et al., 2015). The skin usually becomes dry, scaly, rough, wrinkled, and black spots or spots appear. The aging process is divided into intrinsic, which occurs naturally over time due to biological and extrinsic factors, such as excessive exposure to sunlight, pollution, smoking habits, and unbalanced nutrition (Nisa and Surbakti, 2016).

Indonesia is one of the tropical countries with exposure to ultraviolet rays from the sun throughout the year and is susceptible to skin aging due to long-term exposure (Ahmad and

Damayanti, 2018). Open skin areas that are very vulnerable to exposure to ultraviolet rays are the face, neck, and arms. Free radicals attract electrons from molecules, so skin cells experience damage, functional disorders, and even death (Nisa and Surbakti, 2016). Melanin pigment plays a major role in defending the skin from exposure to ultraviolet rays (Maack and Pegard, 2016).

Meanwhile, pregnant women in the third trimester also experience an increase in hormones that stimulate melanogenesis in epidermal melanocytes through induction of the synthesis of melanogenic enzymes, such as tyrosine and tyrosine-related proteins 1 and 2 (TYRP-1 and TYRP-2) (Filoni et al., 2019) results in hyperpigmentation or darkening of the skin color. The reason is, that the melanocyte-stimifying

hormone (MSH) can regulate pigments that influence skin color. In addition, the hormones estrogen and progesterone trigger excess melanin production on the face, which is called melasma (Putra et al., 2022).

In that case, serious problems occur on the face (Zolghadri et al., 2019) where the tyrosinase enzyme, namely TYRP-1 is the main target in inhibiting the formation of abnormal melanin due to excessive solar radiation (Biswas et al., 2017) and 90% in the pregnant women (Putra et al., 2022). Currently, several methods are used to prevent skin aging on the face such as skin care products and laser technology aimed at tightening the skin. However, this method causes skin problems, so antioxidants sourced from natural ingredients are needed.

One source of natural antioxidants is leunca fruits (*Solanum nigrum* Linn.). The results of phytochemical screening carried out by Khaerunnisa et al. (2022) show that the methanol extract contains flavonoids, alkaloids, saponins, phenolics, tannins, quinones, and steroids. Meanwhile, the ethyl acetate fraction is flavonoids, alkaloids, phenolics, tannins, and steroids, and alkaloids, phenolics, tannins, and steroids for the n-hexane fraction. Most flavonoid secondary metabolite compounds in leunca fruits are quercetin (Husnia and Budiarti, 2021). Apart from that, there are compounds solanine, solamargin, solasonine, and solasodine, which are classified as secondary metabolites of alkaloids (Karmakar et al., 2010).

The antioxidant test by Halim et al. (2018) on leunca fruit juice showed very high activity with an inhibitory concentration (IC_{50}) value of 206.5542 ± 9.3771 mg/L. This has the potential to inhibit the enzyme of TYRP-1 which causes hyperpigmentation on the skin. The use of leunca fruits as anti-skin aging has not been reported, so research must be carried out using a structure-based drug design (SBDD) approach, namely in-silico molecular docking as an initial stage (Meng et al., 2011). This approach aims to identify the similarity of active molecules to specific target proteins with binding affinity as an important value that needs to be considered (Kelutur, 2023). Apart from that, predictions of transdermal drug

delivery and drug safety with Pre-ADMET were also carried out.

Materials and Methods

Data Preparation

Test ligands in the form of flavonoids (quercetin) and alkaloids (solanine, solamargine, solasonine, and solasodine) from the leunca fruits were obtained from research that has been carried out (Husnia and Budiarti, 2021; Karmakar et al., 2010). Then, download these secondary metabolites in PubChem (<https://pubchem.ncbi.nlm.nih.gov/>) with 2D structures in SDF format. Kojic acid as a reference ligand (native ligand) and TYRP-1 protein (Figure 1) were obtained from the Protein Data Bank (<https://www.rcsb.org/>) with the PDB ID code 5M8M.

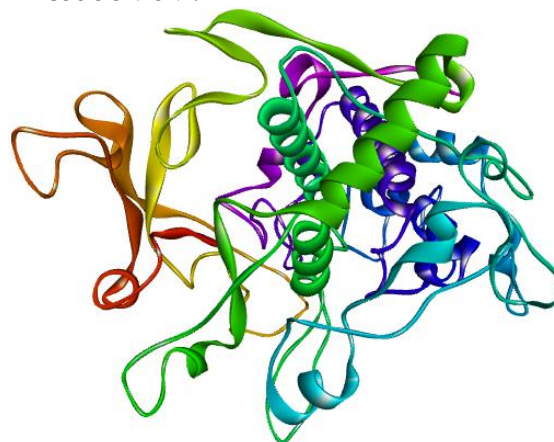


Figure 1. The enzyme of TYRP-1

Procedures

Enzyme and ligands

The water molecule and native ligand were separated from the enzyme of TYRP-1 using Discovery Studio 3.5 Visualizer® (DS). The results obtained are pure enzyme and saved in PDB format (.pdb) (Wibowo et al., 2019). Then, the enzyme was re-prepared using Autodock Tools® 1.5.6 (ADT) by adding Kollman charges and hydrogen polar only then saved in pdbqt format (Arba et al., 2018; Morris et al., 2009). Meanwhile, the native ligand (kojic acid) is obtained when separated from the enzyme using DS by selecting the script menu, selection then selecting protein chains and saving in .pdb format (Wibowo et al., 2019) as well as the test ligand downloaded from PubChem. After that, native and test ligands added

Gasteiger, all hydrogen, and non-polar merge using ADT and saved in pdbqt format format (Kelutur and Mustarichie, 2020).

Identification of active pocket from the enzyme of TYRP-1

Grid box settings to determine the position of the active pocket, namely the size of the grid box and the center coordinate values (x, y, z) using ADT. The grid box values obtained are used as a reference for the process of molecular docking test ligands to the TYRP-1. Meanwhile, the docking parameters are based on the Lamarckian Genetic algorithm (100 times) with the algorithm generation value being 2,500,000 and 150 for the population as well as other values are left at defaults (Hariyanti et al., 2021; Opo et al., 2021).

Molecular docking process

Docking between native ligand and enzyme of TYRP-1 using ADT program (run-autogrid and run-autodock). Then edit the cmd directory (autogrid4 -p dock.dpf -l dock.dlg &) for autogrid and autodock (autodock4 -p dock.dpf -l dock.dlg &) as well as click launch, which indicates the molecular docking process has started (Kelutur, 2022).

Method validation based on the RMSD

Method validation was carried out by evaluating the root-mean standard deviation (RMSD) value. To be more accurate, it is visualized by the overlap between the native ligand crystallography and re-docking (Kelutur, 2023).

Molecular docking of active compounds from leunca fruits to TYRP-1 and visualization

The in silico molecular docking process for the test ligands was carried out in the same way as the validation process, which used parameters of grid and docking from the validation results (Kim and Skolnick, 2008). The molecular docking process uses ADT, where the results obtained are opened with Notepad++® to obtain the binding affinity (ΔG and K_i) based on histogram clustering. In addition, visualization of amino acid residues (hydrogen bond, HB and Van der Waals, VdW) was carried out with DS (Kelutur et al., 2021; Wibowo et al., 2019).

Prediction of pharmacokinetic properties and toxicity

Test and native ligands that have the potential as drug products are drawn and uploaded in the Mol

file format (*.mol) for prediction of transdermal drug delivery, mutagenic, and carcinogenic using Pre-ADMET

(<https://preadmet.webservice.bmdrc.org/adme/>).

Results and Discussion

Results

Validation Method

In this study, the RMSD value obtained was 2.328 Å, as shown in Figure 2 when overlapping. Meanwhile, the coordinates of center values for the TYRP-1 protein are x = -31.471, y = -3.610, and z = -24.849, respectively, with grid points of 40×40×40 as well as a spacing of 0.375 Å. The algorithm method used is Lamarckian Genetic, with a GA run value of 100 times.

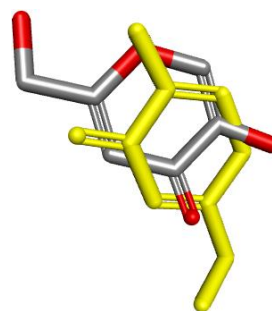


Figure 2. Overlap native ligand between crystallography (yellow) and re-docking (gray)

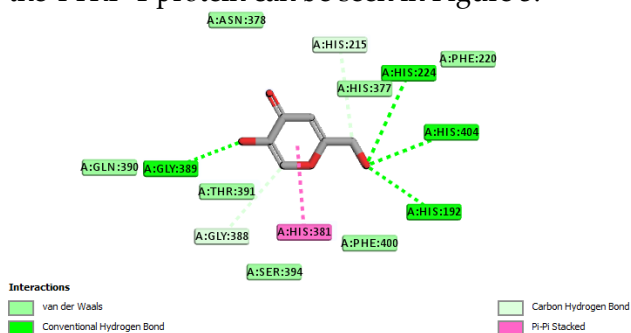
Interpretation of Ligand-Enzyme Interactions and Visualization

The results of in silico molecular docking obtained binding affinity and interactions, shown in Table 1.

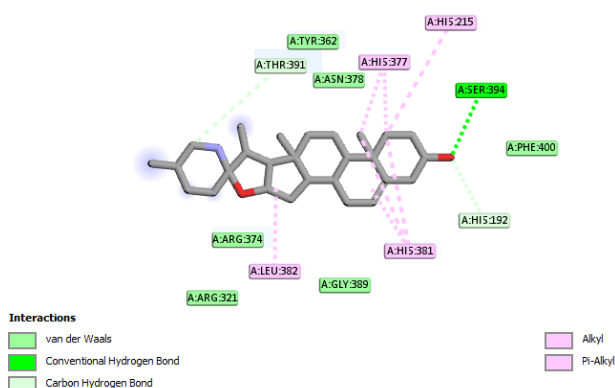
Table 1. The Results of Molecular Docking to TYRP-1

Compounds	Amino Acid Residue Interactions				ΔG (kcal/mol)	Ki (nM)
	Hydrogen Bonds		Van der Waals Bonds (Hydrophobic)			
Test ligands (flavonoid)						
Quercetin	His192, His377, Thr391, His381, Asn378, Arg374, and Arg321	Gln390, Gly388, Phe400, His215, and Gly389	-7.74	2110		
Test ligands (alkaloids)						
Solasodine	His192, Ser394, and Thr391	Tyr362, Asn378, Arg374, Arg321, Gly389, Phe400	-8.58	517.15		
Solanine	Thr391	Gly388, Leu379, Phe220, Ile399, and Val401	+951.97	-		
Solamargine	-	-	+197.10	-		
Solasoline	Tyr362, Thr391, and Ser394	Asn378, Pro395, Gly389, Gly388, Gln390, and Arg321	+975.47	-		
Reference ligand						
Kojic acid	His192, Gly389, His224, His404, Gly 388, and His215	Asn378, Gln390, Thr391, Ser394, Phe400, His377, and Phe220	-5.50	92720		

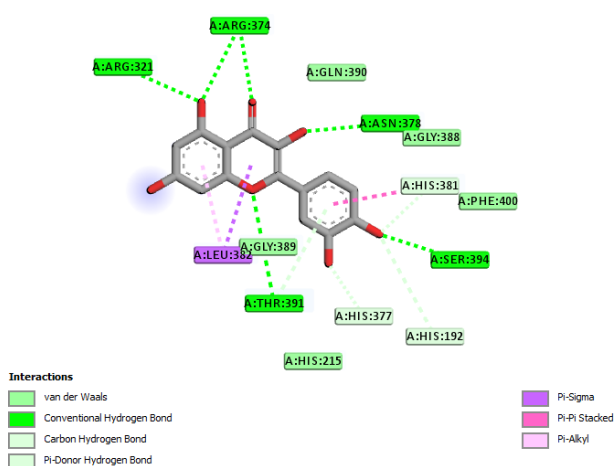
The interaction between the active compounds from leunca fruits and the amino acid residues of the TYRP-1 protein can be seen in Figure 3.



(a)



(b)



(c)

Figure 3. Visualization of molecular docking results of kojic acid (a), solasodine (b), and quercetin (c)

ADME-Tox

The prediction results of the transdermal route and toxicity are shown in Table 2.

Table 2. The Results of ADME-Tox

Compounds	ADME	Toxicity	
	Skin Permeability (cm/hours)	Mutagenic	Carcinogenic
Quercetin	-4.433	+	-
Solasodine	-3.377	-	-
Kojic acid	-4.785	+	-

Discussion

The validation method is declared valid because the RMSD value is ≤ 3.00 Å (Jain and Nicholls, 2008). It shows that the docking software is ready to test ligands. If the bond value between the ligand and enzyme is low, the bond is stronger due to the stability and strength of non-covalent interactions. Binding affinity can be evaluated from the free energy of binding (ΔG) and inhibition constant (K_i) values (Kelutur, 2023). The smaller or minus the ΔG value indicates increased activity so that less energy is needed to form stronger bonds (Umamaheswari et al., 2013).

ΔG , also called Gibbs free energy, aims to predict whether a reaction can proceed spontaneously or not. A value of $\Delta G < 0$ means the reaction can occur spontaneously, $\Delta G = 0$ shows the reaction takes place in equilibrium, and $\Delta G > 0$ means the reaction is not spontaneous (Chagas et al., 2018). Experimentally ΔG is closely related to K_i so that the equation is obtained :

$$\Delta G = -RT \ln K_i$$

where the ΔG value is to estimate the interaction ability between active compounds from leunca fruit and macromolecules, namely TYRP-1 (Kartasmita et al., 2009). K_i explains the inhibitory ability of compounds to the target. So, the smaller the K_i value, the stronger the inhibitory force (Umamaheswari et al., 2013).

Binding interactions between the ligand and amino acid residues indicate binding to the active pocket of TYRP-1 (Kelutur, 2023). The most important types of bonds in biological systems are HB and VdW. HB is a non-covalent interaction and also represents a good electrostatic interaction. This bond plays a crucial role when the ligand-enzyme binds to each other, which functions as a proton donor and acceptor with electrostatic properties. Although the strength of HB is weaker than ionic (covalent) bonds, it is very dominant in the specificity of molecular recognition and the conformation of some macromolecules (Muchtaridi et al., 2018).

VdW is a hydrophobic interaction that is very important for drug-enzyme interactions. The strength of the hydrophobic interaction depends largely on the quality of the steric effect between the two molecules (Muchtaridi et al., 2018). His192 becomes a crucial amino acid residue when active compounds from leunca fruits and drugs as a reference ligand to TYRP-1 as an anti-aging skin target.

Skin permeability is an important consideration for product efficacy and the development of drug delivery systems by the transdermal route. A compound is said to have potential as a drug if it has a relatively low skin permeability value, namely $\log K_p > -2.5$ cm/hours (Abdullah et al., 2021). Toxicity in the form of mutagenic and carcinogenic is carried out to determine the characteristics of compounds that can cause cell or organ damage (Kelutur et al., 2022).

Based on the results of a review conducted by Putra et al., 2022 it is explained that kojic acid is one of the drug topical products used for hyperpigmentation disorders in pregnant women, it has a low absorption system, no fetomaternal risk in animals, and no data available on the system reproductive human, but not approved by the US FDA. Alpha hydroxyl acid (AHA) is a drug that has good efficacy because of lower toxicity when given to pregnant women.

Conclusions

Based on in silico molecular docking as well as predictions of skin permeability and toxicity, it can be concluded that only the alkaloid secondary metabolite, solasodine, from leunca fruits, has the potential to inhibit the formation of abnormal melanin, namely TYRP-1. Moreover, it has the potential to be used as a topical product for cutaneous changes in pregnant women.

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The Role of Artificial Intelligence (AI) as Learning Style Master of Student in Digital Era

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Abstract: Artificial Intelligence (AI) is the one of popular technology in the world of education in the digital era. AI is a system used to imitate human intelligence or dead object with the use of sophisticated technology to accomplish human cognitive problems. But the usage of AI has a significant impact that is problems of privacy and data security, as well as ethics and society. Because of this, the usage of AI has to do wise and precise to produce a maximum advantage for improving education. The article aims to analyze the role of AI in helping student assignments. This research used a descriptive qualitative approach and the data was reached by a Google form questionnaire. This research used data from a questionnaire via Google form given to the master of student Islamic Education UIN Sunan Kalijaga Yogyakarta semester 1 2022/2023. , the data was obtained via Google form and then, the link was disseminated by Whatsapp. The primary data of research earned by Google from respondents. The data analysis used a statistical description. Referring to the technique, the researcher only describes the data that has been collected without the intention of concluding. The result showed 73,4% of respondents used AI for doing assignments, and 26.7% of respondents used not AI for doing assignments.

Keywords: Artificial Intelligence (AI), Era Digital, Learning Style

Introduction

Technological advances have made education experience a significant digital transformation. Online learning platforms, educational applications and other technology-based solutions also play an important role in providing access and increasing learning efficiency. Technological advances in the last few decades, especially in the field of artificial intelligence (AI), have taken an increasingly dominant role in various sectors, including education. In this context, the relationship between students and AI becomes increasingly important and interesting to research .

Artificial Intelligence (AI) can be likened to the brain of a robot (Gunagama & Lathifa, 2017) . Overall, the discussion about AI is quite broad and varied because the elements that make up AI technology are not studied using one point of view, but from various points of view. (Hidayanti & Azmiyanti, 2023) . AI is a system that shows

intelligent behavior in achieving a certain goal, the implementation of which is in the form of a stand-alone computer program or embedded in hardware that has a specific use (Hidayanti & Azmiyanti, 2023) . The current generation needs to take advantage of developments in digital technology which have an impact on making everyday life easier (Alia, 2018) . Students are agents of change who absolutely must be developed through increasing competence through education and teaching (Sari et al., 2023) . The learning process in the context of the application of science, technology and skills is carried out to improve student quality which functions to produce outputs and outcomes that are beneficial to education (Setiawan et al., 2023) .

The existence of AI has had a significant impact on the world of education (Latifah & Ngalmun, 2023) . With its ability to analyze and process data, AI has provided innovative solutions and enabled a more personalized and adaptive learning

approach (Nurbayanni et al., 2023) . In the context of the relationship between students and AI, there are several aspects that are worth exploring. *First*, the use of AI in learning can influence students' motivation and interest in learning (Suyedi & Idrus, 2019) . With sophisticated technology, students can access learning material in a more interactive and interesting way. Apart from that, AI's ability to provide instant feedback can also influence the student learning process (Kennedy, 2023) .

Second, it is important to consider the ethical and social implications of using AI in education. In this context, questions about data privacy, fairness of access, and the impact of replacing humans by machines become relevant. Students also need to understand how AI operates, its limits, and how to utilize it responsibly. Because although AI offers various opportunities to improve learning, there are also challenges such as privacy and ethical issues that students must be aware of. *Third*, studies of students' relationship with AI can also provide insight into students' preparation for an increasingly automated world of work. Students need to develop skills and knowledge relevant to AI technology to prepare themselves to face future challenges.

Discussions about artificial intelligence are currently of interest to researchers, including those in the educational realm. The author found several studies on artificial intelligence, including: Research conducted by Ismaila Temitayo Sanusi et al on The role of learners' competencies in Artificial Intelligence Education (Sanusi et al., 2022) . The research results show that it reveals the importance of teamwork and the importance of human collaboration tools in artificial intelligence literacy through course content. These findings emphasize the importance of teamwork among students to keep up with the pace of technological development. Multigroup analysis also did not show significant differences between gender and school type.

Furthermore, research was conducted by Agung Rinaldy Malik on Exploring Artificial Intelligence in Academic Essay: Higher Education Student's Perspective (Malik et al., 2023) . The findings show positive reception of the AI-powered writing tool,

with students recognizing its benefits in grammar checking, plagiarism detection, language translation, and essay outlines. AI was found to improve students' writing skills, self-efficacy, and understanding of academic integrity. However, some students expressed concerns about the potential impact on creativity, critical thinking, and ethical writing practices. The study emphasizes a balanced approach to AI integration, where AI collaborates with human authors, and also identifies popular AI tools used by Indonesian students. Furthermore, research conducted by Miguel Martínez-Comesana on the Impact of artificial intelligence on assessment methods in primary and secondary education: Systematic literature review (Martínez-Comesaña et al., 2023) . The research results show that the main contributions of the application of AI in the assessment of students at lower educational levels focus on predicting their performance, automating and making evaluations more objective through neural networks or natural language processing, the use of educational robots to analyze their learning processes, and detect certain factors that make a class more interesting. This review shows the existing possibilities and uses that AI can bring to the world of education, especially in the evaluation of student performance at primary and secondary levels.

Based on several studies by the researchers above, the author has not found research on the role of artificial intelligence as a student learning style. Therefore, the aim of this research is to conduct research on the role of AI as a student learning style in the digital era. So it is important to investigate this research so that we can find out the extent of AI's role in the digital era as a student learning style.

Materials and Methods

This research uses a qualitative descriptive research method. The data used in this research is in the form of a questionnaire survey created via Google Form by asking several questions about AI as a student learning style. The stages carried out by the researcher are formulating the problem,

choosing a theoretical basis, making a hypothesis, collecting data, analyzing the data and making conclusions. This research was carried out in the 2nd semester of the Islamic Religious Education master's program at UIN Sunan Kalijaga Yogyakarta. The informants in this research were students of the 2nd semester PAI master's program. Apart from interviews, data collection techniques were using questionnaires. Through the questionnaire, researchers created a Google form and then distributed the link via the WhatsApp application to respondents. The research subjects were students of the 2nd semester PAI master's program from classes A, B, C and D. In this research, the type of data collected was primary data, meaning the data was directly obtained from respondents who filled in the Google form link, so the data obtained was not in doubt. The data analysis technique uses descriptive statistical techniques. With this descriptive statistical technique, the researcher only describes or describes the data that has been collected without the intention of making a conclusion.

Results and Discussion

The Role of Artificial Intelligence in Education in The Digital Era

The digital era is the term used for the period where internet technology and information technology develop rapidly. This era is marked by technological developments and significant growth in the sharing of knowledge in an increasingly developing society. Artificial Intelligence (Artificial Intelligence) is a computer science discipline that has the ability to complete tasks with a level of excellence similar to that performed by humans. Meanwhile, in other sources it is explained that Artificial Intelligence is a subfield in computer science that emphasizes the representation of knowledge using symbols rather than numbers, as well as processing information through heuristic methods or certain rules. AI is a technique used to imitate the level of intelligence possessed by humans and inanimate objects to solve various types of problems (Ismawati & Ramadhanti, 2022). The term Artificial Intelligence was first introduced

in 1956 by McCarthy, who was named "the science and technique of making intelligent machines" (Borges et al., 2021). In this era, there is a massive integration of data from sensors in physical space and this data is analyzed by artificial intelligence in cyberspace. The results of this analysis are then returned to humans in various forms in the physical environment. Artificial Intelligence has the ability of machines to use algorithms to learn from data, and use what they have learned to make decisions like humans do (Arief & Saputra, 2019).

In the digital era or Society 4.0 era, AI has played an important role in various aspects of life, especially in the education sector. Along with the acceleration of technological development in the education domain, there has been a significant increase in the use of advanced technology that supports the learning process in this digital era. With increasingly rapid technological growth in the world of education, more and more sophisticated technology can provide support in the learning process in the digital era (Ismawati & Ramadhanti, 2022). All companies and educational institutions are intensifying artificial intelligence technology to become a new platform in the industrial revolution. In this case, the school education system has a vital role in preparing global individuals and producing a quality workforce for the future. This change not only affects teaching methods, but more fundamentally, changes the conceptual view regarding the substance of education itself. The application of Artificial Intelligence (AI) in various sectors of life has presented its own challenges for the education sector. Universities are trying to quickly produce graduates with competencies in the AI field in order to meet industry demand. On the other hand, the application of AI has also spread to the education sector, including primary, higher and even professional education. There is a belief that AI can help individuals to learn more effectively and achieve their desired educational goals (David, 2021a).

There are several applications that utilize the role of AI and can be used in the education sector, including:

1. Chatbot AI can function as a responsive virtual assistant, helping answer questions, providing

guidance or solving problems in real-time. AI can also facilitate discussion and collaboration between students through interactive learning platforms. However, the use of AI in education also involves important challenges and considerations. Clear policies are needed to protect the privacy and security of student data. In addition, factors such as the availability of technological infrastructure, training of lecturers in using AI, and the costs of implementing and maintaining AI systems also need to be considered (Muarif et al., 2023) .

2. Voice Assistant: is an artificial intelligence technology that is popular and often used in various fields, including in the world of education. Examples of well-known voice assistants include Google Assistant (developed by Google), Siri (used in Apple products), Cortana (created by Microsoft) and others. The existence of Google Assistant can help students find material sources, reference questions, access articles, or find books by just using voice commands or mentioning certain keywords (Mutaqin et al., 2023) . Using voice assistants provides students with the opportunity to interact with learning material independently, without having to rely on direct communication with the teacher. So that the educational platform can be accessed anywhere and at any time, students can learn independently without having to worry about confusion, even without guidance from a teacher or tutor (Fitria, 2021a) .
3. Chat GPT : is a variant of the GPT-3 (Generative Pre-trained Transformer 3) model developed by OpenAI. This platform is specific in producing text that resembles human communication in the form of conversation, including translation, text summarization, answering questions, and generating text with little or no special training for each specific task (Wahid et al., 2023). ChatGPT has capabilities that has created great innovation in the academic world and also brought a significant touch of innovation in current technological developments, especially in the context of the use of technology in the field of education (Faiz & Kurniawaty, 2023) . Therefore, expansion and

restructuring in educational methods and systems is needed to integrate a more relevant curriculum (Kim, 2023) .

4. Grammarly: is a cloud-based platform that aims to provide assistance in the writing process in checking spelling, grammar, using punctuation, and maintaining clarity in writing (Sucipto et al., 2023) .
5. Presentation Translator: this technology is similar to Voice Assistant in that it relies on voice interaction to carry out its functions. However, Presentation Translator has special specifications in terms of deciphering or conveying text from one language to another as desired. So users can listen to texts, articles or digital books in the language they choose without having to read them. By using AI Speech Recognition, users can easily understand journals, articles and books from various languages more efficiently and quickly (Mutaqin et al., 2023) .

From the perspective of educational applications, in the last decade many studies on artificial intelligence in education stated that there are four roles of AI in education, namely (Hwang et al., 2020) :

1. Smart Tutor, is a category that has a big role in education. What is included in this category is an intelligent tutoring system, an adaptive/personalized learning system or a recommendation system. Several meta-analytic studies have shown the effectiveness of intelligent learning systems in improving learning outcomes. Cognitive Tutor, which was developed to support mathematics and science tutoring, is a very intelligent tutoring system.
2. Smart Tutee, research in this category is rare because most AI-based education systems typically focus on providing support to students rather than giving them opportunities to act as tutors or advisors. However, involving students in situations where they help others, such as AI students, to understand complex concepts, can be a very effective approach in improving their higher-order thinking skills and knowledge.

3. Smart learning tools or partners, these devices have the potential to assist students in data collection and analysis in an effective and efficient manner. This allows them to focus on important aspects such as higher-level thinking such as inference and prediction rather than getting bogged down in low-level tasks such as editing and calculations.
4. Advising policy makers, in using artificial intelligence (AI) technology, policy makers can gain deeper insight into trends and issues in the world of education, both in large-scale and small-scale contexts. This allows them to more effectively design and assess the effectiveness of educational policies.

From the several roles of AI above, it can be concluded that advances in the field of artificial intelligence (AI) have brought education into a new era. By combining human and computer intelligence, AI systems can become intelligent teachers, tools, or friends in education. This helps in decision making in the world of education. Combining AI and education opens up new opportunities to improve teaching and learning. Teachers can use intelligent systems to assist in assessment, collect data, improve learning progress, and create new strategies. Students can also feel the benefits of smart tutors and more flexible learning to improve learning outcomes. Moreover, the integration of AI and education not only changes education itself, but also influences the way we understand human knowledge, thought and culture. Therefore, the use of AI in education has become a major research focus in the field of computers and education. AI aims to be a liaison between educators, students, computer scientists, and practitioners to advance state-of-the-art technologies in this growing field (Hwang et al., 2020).

Apart from that, Lijia Chen's research (Chen et al., 2020) also illustrates the results that AI has seen significant adoption and is widely used in educational contexts, especially by educational institutions, in various forms. AI was initially present in the form of computers and related computing technology, then developed into web-

based and online intelligent education systems, and finally experienced development with the use of integrated computer systems, along with other technologies.

In other sources, several roles of Artificial Intelligence in education will determine educational experiences in the future (Tjahyanti et al., 2022):

1. Artificial intelligence is able to automatically carry out basic tasks in the educational process, including the assessment process. Although it does not completely replace human judgment, this role is almost close to reality.
2. Educational software can be tailored to students' needs. From kindergarten to graduate school, AI's impact on education is through the application of a more significant level of individualized learning. This can be through adaptive learning programs, games and software. This system responds to student needs, places greater emphasis on certain topics, repeats things students have not yet mastered, and generally helps students to work at their own pace, whatever that may be.
3. AI-based programs can provide useful feedback for students and teachers. Artificial intelligence is not only able to support teachers and students in developing a curriculum that suits their needs, but also provides an evaluation of the overall success of the curriculum. Some educational institutions, especially those providing online programs, utilize AI systems to monitor student progress and alert teachers if there are potential problems in student performance.
4. AI-powered data can change the way schools find, teach, and support students. Intelligent data collection, supported by intelligent computer systems, has changed the way universities interact with prospective and current students. From the recruitment process to helping students choose the most appropriate courses, intelligent computer systems help increase personalization in every aspect of the

college experience to better suit students' needs and goals.

Utilization of Artificial Intelligence as a Learning Style

The use of *Artificial Intelligence* (AI) is something commonplace in the digital era. *Artificial Intelligence* (AI) is a technology that imitates human abilities to think, understand, learn, and carry out actions that sometimes require human intelligence such as speaking, language processing, and analyzing images or sounds (Mujiono, 2023). *Artificial Intelligence* (AI) makes it easy for someone to complete tasks efficiently using the help of technology (Sirinti Pongtambing et al., 2023). The use of *Artificial Intelligence* (AI) has also penetrated the world of education, and is predicted to make it easier to achieve educational goals (David, 2021b). This shows that the use of *Artificial Intelligence* (AI) cannot be separated from the world of education.

Artificial Intelligence (AI) applications that can be used in the world of education are *Computer Assisted Education* (CAE), *U-Dictionary*, *Digital Reporting Education* (DRP) (Zahara et al., 2023), *Chatbots*, *AI Tutor Systems*, and plagiarism detection tools (Afrita, 2023). The results of interviews with Masters of Islamic Religious Education (PAI) students include explanations regarding the use of *Artificial Intelligence* (AI) applications in the world of lectures. Some of these applications are ChatGPT, QuillBot, Canva Magic Write, and Turnitin (FA, *personal communication*, 2023). Another interview result related to the *Artificial Intelligence* (AI) application used is Grammarly (NS, *personal communication*, 2023). Based on the results of the interview, the applications that are often used are ChatGPT, Grammarly, Canva Magic Write, Turnitin, and QuillBot.

Referring to interview results regarding the use of *Artificial Intelligence* (AI) in the form of ChatGPT, QuillBot, Canva Magic Writer, Turnitin, and Grammarly. This application is very familiar in the world of lectures. The use of Grammarly has contributed to language translation from Indonesian to English (Marliyanda et al., 2022). The next application is QuillBot. QuillBot has the benefit of organizing language or paraphrasing

sentences (Fitria, 2021b). Apart from QuillBot, ChatGPT can be used to organize the structure of a sentence, and can create summaries of long texts (Zen Munawar et al., 2023). If QuillBot, Grammarly, and ChatGPT can be used to organize sentences correctly, then Turnitin has a different role from these three applications. Turnitin detects plagiarism from a written work (Indonesian Islamic University & Risparyanto, 2020).

Referring to the results of interviews from Master of Islamic Religious Education (PAI) students regarding the ChatGPT, QuillBot, Grammarly and Turnitin applications which actually have benefits for students. These benefits are helping students complete lecture assignments on time (MHY, *personal communication*, 2023), to search for literature related to Islamic Religious Education (PAI) (N, *personal communication*, 2023), and used as a tool to help students in their work. Scientific work is mainly concerned with checking plagiarism, as well as arranging sentences neatly (NH, *personal communication*, 2023). Based on this interview, it can be concluded that the use of *Artificial Intelligence* (AI) is the learning style of Master of Islamic Religious Education (PAI) students. They use *Artificial Intelligence* (AI) to assist in completing lecture assignments.

The use of *Artificial Intelligence* (AI) in the world of education, especially for Masters of Islamic Religious Education (PAI) students, has advantages and disadvantages. These advantages are that it is easy for someone to get the information they want, saves time, and is able to analyze data continuously (ISH, *personal communication*, 2023). This is in line with the opinion of Endang Irawan Supriyadi and Dianing Banyu Asih that *Artificial Intelligence* (AI) can complete work in a short time (Supriyadi & Asih, 2021). Another opinion regarding the advantages of *Artificial Intelligence* (AI) is that it provides various learning literature (Limna et al., 2022).

Every technology definitely has advantages and disadvantages. According to an interview with the Master of Islamic Religious Education (PAI), *Artificial Intelligence* (AI) has disadvantages in the form of reducing student literacy, reducing critical thinking, and making students less productive (ARY, *personal communication*, 2023). This is in line

with Bambang Karyadi's opinion that *Artificial Intelligence* (AI) is only technology that helps humans, and humans should not be completely dependent on *Artificial Intelligence* (AI) (Karyadi, 2023a) . Based on this, the use of *Artificial Intelligence* (AI) cannot actually be separated from the negative side, and students need to use *Artificial Intelligence* (AI) wisely .

Student Overview of Using Artificial Intelligence

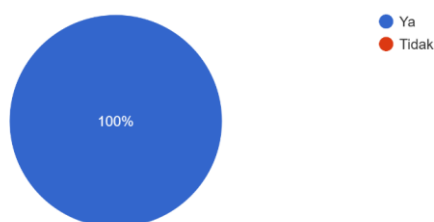
Research data was collected by researchers through questionnaires. The questionnaire was made in online form, namely with the Google Form application. Making the questionnaire aims to make it easier for researchers to measure or find out the extent of AI's role as a student's learning style. The questionnaire was filled out online by second semester students from classes A, B, C and D with 15 students as respondents. Respondent descriptions can be seen in the following table:

Table 1. Description of Respondents

No.	Class	Respondent	Percentage
1.	Class A	2 students	13.3%
2.	Class B	6 students	40%
3.	Class C	7 students	46.7%
4.	Class D	0 students	0%
Number of Respondents		15 students	100%

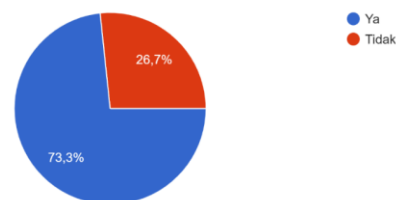
From table 1 it can be explained that of the 15 respondents there were 2 students from class A with a percentage of 13.3%, 6 students from class B with a percentage of 40%, 7 students from class C with a percentage of 46.7% and 0 respondents from class D. From the questionnaire data provided filled out the Google form that all respondents agreed that the use of AI makes the lecture process easier. For more details, see the following diagram

Penggunaan AI membuat anda lebih mudah dalam proses perkuliahan
15 jawaban



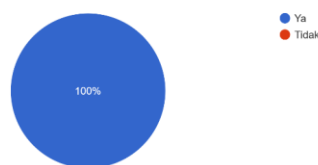
Various perceptions from responses regarding use in doing college assignments. This can be seen from the following diagram:

Penggunaan AI membuat anda lebih nyaman dalam mengerjakan tugas kuliah
15 jawaban



Based on the diagram above, it can be seen that 11 respondents with a percentage of 73.3% agreed that AI makes respondents more comfortable in studying. The remaining 4 respondents with a percentage of 26.7% did not agree with this. As for the various perceptions of respondents from the indicators that researchers provide regarding how important AI plays a role in lectures, it can be seen that AI gives a positive response because it can help students in lectures. AI technology has the potential to facilitate students and also contribute to increasing efficiency and effectiveness in lectures. This can be seen from the following diagram:

Penggunaan AI sangat efektif dan efisien sebagai alternatif dalam membantu perkuliahan di Era Digital
15 jawaban



From the 15 respondents who filled out the Google form, it was also seen that the respondents agreed that using AI in lectures in the digital era is an effective and efficient alternative. The use of AI in student learning has shown significant potential in improving learning effectiveness and experience. Joupy G. Z Mambu et al (Mambu et al., 2023) in their article show that AI helps in optimizing time and effort as well as increasing learning efficiency and providing learning experiences to students. AI systems can provide recommendations and learning materials tailored to their needs. The use of AI creates a more personalized learning experience and helps students achieve optimal results. This is in

line with Karyadi's opinion (Karyadi, 2023b) in his article that AI can function as a personal virtual tutor that provides individual guidance based on students' needs and weaknesses. Apart from that, AI can also increase student interaction and involvement in learning. For example, in Chat GPT AI can be used as a responsive virtual assistant to answer student questions and solve problems in real time. This allows AI to act as a learning chatbot which was developed to provide assistance and answers to questions related to material, assignments or certain topics and the chatbot will provide responses in the form of appropriate answers and explanations. This allows students to study independently. Based on the explanation above, the use of AI in student learning allows for better personalization and adaptation. Through data analysis, AI can identify the learning preferences and needs of each student individually. With a deeper understanding of each student's learning style and level of understanding.

Conclusions

The use of *Artificial Intelligence* (AI) is something commonplace in the digital era. *Artificial Intelligence* (AI) is a technology that imitates human abilities to think, understand, learn, and perform actions that sometimes require human intelligence such as speaking, language processing, and analyzing images or sounds. *Artificial Intelligence* (AI) makes it easy for someone to complete tasks efficiently using the help of technology. The use of *Artificial Intelligence* (AI) has also penetrated the world of education, and is predicted to make it easier to achieve educational goals. This shows that the use of *Artificial Intelligence* (AI) cannot be separated from the world of education. In the world of education, especially for Masters of Islamic Religious Education (PAI) students, the use of *Artificial Intelligence* (AI) has advantages and disadvantages. These advantages are that it is easy for someone to get the information they want, saves time, and is able to analyze data continuously. Of the 15 respondents who filled out the Google form, 11 respondents with a percentage of 73.3% agreed that AI made the respondents

more comfortable in doing their studies. . The remaining 4 respondents with a percentage of 26.7% did not agree with this. As for the various perceptions of respondents from the indicators that researchers provide regarding how important AI plays a role in lectures, it can be seen that AI gives a positive response because it can help students in lectures.

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Euphemism Urgency in Multicultural Education of Indonesian Schools in Malaysia

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Abstract: This article aims to provide a comprehensive overview of the significance of euphemism in multicultural education in Indonesian schools in Malaysia. A qualitative method employing a case study approach was used in this study. The findings highlight the incorporation of euphemism in multicultural education through teaching materials and spoken learning strategies. The imperative lies in establishing an inclusive educational community that embraces differences and fostering mutual respect within the school community through the use of subtle language. By integrating euphemisms into multicultural education, this article underscores the necessity of creating an educational community that prioritizes not only academic achievements, but also the development of character values that appreciate cultural diversity. Therefore, the adoption of a refined language has emerged as a pivotal factor in establishing an inclusive Indonesian school community, laying a robust foundation for understanding, tolerance, and mutual respect within the Malaysian context.

Keywords: euphemism, multicultural education, Indonesian schools in Malaysia

Introduction

Indonesian schools have emerged in Malaysia as platforms to facilitate access to education for children with Indonesian citizenship. The Indonesian government, with a focus on preserving cultural identity, endeavors to provide equitable education for Indonesian children residing in Malaysia. These schools, operating based on the Indonesian national education system, offer education ranging from kindergarten (TK) to high schools (SMA). Indonesian schools also serve as a crucial platform for nurturing nationalism among the offspring of Indonesian citizens abroad (Fitriati et al., 2014).

Primary Indonesian schools in Malaysia are categorized into two institutions: the Kuala Lumpur Indonesian School (Yuliani, 2023; Luthfiyana, 2022) and the Kota Kinabalu Indonesian School (Masturoh & Ridlo, 2020; Sari & Waluyo, 2021). Furthermore, the Indonesian government has established Community Learning

Centers (CLC) for teaching and learning activities throughout various regions in Malaysia to extend educational outreach to more Indonesian children (Jatmika, 2023).

Indonesian schools in Malaysia exhibit distinctive characteristics compared to their Indonesian counterparts. The student body comprises the children of Indonesian migrant workers who hail from diverse regions within Indonesia. A significant proportion of these students were born and raised in Malaysia, leading them to acquire substantial social, cultural, and linguistic knowledge specific to Malaysia (Dikdas, 2021). The central concern addressed in this article is the question of what the problem is. Notably, children of Indonesian migrant workers enrolled as students in Indonesian schools in Malaysia often grapple with a limited understanding of the Indonesian language and culture. This issue underscores the necessity for multicultural education, which can facilitate students'

comprehension of linguistic and cultural diversity, thereby preventing conflicts in their daily lives.

The multicultural education presented in this paper revolves around euphemism-based education. Euphemism involves the utilization of milder or more delicate words or expressions to substitute harsh, contentious, or more direct language. This linguistic concept is frequently employed in communication to alleviate the tension, discomfort, or unkindness that may arise from the use of more assertive words. Euphemisms have applications in various contexts, including everyday conversations, literature, politics, and diverse fields (Allan and Burridge, 1991).

Multicultural education has found extensive application across various countries, such as the monolingual ideology inherent in South Korean multicultural education (Jang, 2023), multicultural education within the framework of teacher education laws in Norway (Benediktsson, 2022), school-based multicultural education curriculum in China (Wang & Gao, 2023), multicultural education practices in Arabia (Masry-Herzallah & Amzalag, 2021), multicultural education within teacher education in Israel (Paul-Binyamin & Haj-Yehia, 2019), empowerment pedagogy and critical multicultural education in African American schools (Wiggin & Watson-Vandiver, 2019), and the personification of multicultural education in Russia (Gabdulchakov, 2014). To the best of our knowledge, there seems to be a gap in research specifically addressing the implementation of multicultural education in Indonesian schools in Malaysia. Prior studies have provided a broad overview acknowledging the great potential of multicultural education in a pluralistic society. However, a comprehensive analysis exploring the imperative of employing euphemisms in the context of multicultural education in Indonesian schools in Malaysia appears to be lacking.

This study endeavors to bridge the existing research gap by delving into the significance of employing euphemisms in the realm of multicultural education within the school environment. Euphemisms, serving as a communicative tool to substitute words that might be perceived as impolite or inappropriate, can prove highly valuable in fostering harmonious

dialogue and mutual understanding among students from diverse cultural backgrounds in Indonesian schools in Malaysia. The objective of this study is to elucidate the critical role of euphemisms in constructing inclusive relationships and mitigating potential conflicts arising from cultural differences. This study discusses the urgency of euphemisms in multicultural education, focusing on two key aspects: (1) the imperative of incorporating euphemisms in teaching materials and (2) the urgency of integrating euphemisms into learning strategies.

Materials and Methods

This study employs a qualitative method with a case study approach to comprehensively investigate the conditions of schools in Indonesia within the realm of multicultural education and explore the imperative role of euphemisms in this educational context. The selection of the case study approach aligns seamlessly with the research focus, aiming to depict the intricate landscape of Indonesian schools and delving into the urgency of incorporating euphemisms in multicultural education. This method facilitates a nuanced understanding of the potential obstacles to implementing multicultural education and seeks to propose viable solutions. The case study approach enables researchers to delve into detailed and in-depth information through meticulous observation. These observations transpired organically during on-site and online visits to the selected schools, namely Kuala Lumpur Indonesian School and Kota Kinabalu Indonesian School. Additionally, qualitative methods will be employed to gain a profound understanding of the urgency of euphemism within the context of multicultural education. Through the analysis of qualitative data, the researchers aimed to unravel the dynamics of how euphemisms are either employed or avoided in diverse multicultural educational settings and explore their impact on intercultural communication and understanding within the school environment. By intertwining qualitative methods with a case study approach, this research makes a valuable contribution to the

comprehension of multicultural education in Indonesia and the pivotal role played by euphemisms. Beyond that, the study aims to offer insights into the potential challenges encountered in implementing multicultural education within Indonesian schools and strives to present pragmatic solutions to overcome these challenges.

Results and Discussion

Through observations at the Kuala Lumpur Indonesian School, Kota Kinabalu Indonesian School, and the Community Learning Center (CLC) in Malaysia, the author has unearthed compelling insights pertaining to educational practices within these Indonesian schools. First, it was noted that the curriculum and instructional materials were aligned with those utilized in Indonesia. Second, the teaching staff comprised development and tutor teachers. The guidance teachers, directly appointed by the Indonesian Ministry of Education, are complemented by local tutor teachers who exclusively teach at the Teaching and Learning Activity Center or the Community Learning Center.

It can be asserted that the educational approach to Indonesian schools in Malaysia has not fully embraced a multicultural education framework. While adhering to Indonesia's established educational patterns is not inherently problematic, introducing educational diversity for Indonesian children in Malaysia would be beneficial, enriching their learning experiences in multicultural settings. By integrating a multicultural approach into the learning context, Indonesian Schools in Malaysia can evolve into educational platforms that not only foster academic intelligence, but also instill a profound understanding of the intricate and diverse world surrounding them. Consequently, the author advocates the implementation of multicultural education based on euphemism within Indonesian Schools in Malaysia.

Can Euphemisms Find a Place in Multicultural Education?

Euphemist practices can indeed be incorporated into the learning environment of Indonesian

schools in Malaysia as part of multicultural education. Multicultural education within Indonesian schools in Malaysia extends beyond teaching cultural diversity; it encompasses euphemist practices as an integral element of the learning process. In this context, the utilization of euphemism has emerged as a potent tool for establishing a learning environment characterized by profound respect for cultural differences. Teachers can employ softer, more affirmative languages to convey concepts related to cultural diversity, thereby mitigating the potential for conflict or discomfort among students.

The use of euphemisms contributes to cultivating a mindset that is more open and attuned to diversity, fostering an atmosphere in which every student feels esteemed regardless of their cultural background. This practice of euphemism extends beyond the language used in teaching; it also involves communication strategies that support cross-cultural understanding and nurture interpersonal skills that are crucial in our increasingly global society. Consequently, euphemism-based multicultural education not only molds students who are more empathetic and accepting of diversity but also nurtures individuals capable of effective communication in our progressively complex global context.

The integration of euphemisms within the realm of multicultural education is an essential component of efforts to materialize the concept of inclusive education. Multicultural education transcends the imparting of academic knowledge and actively promotes mutual respect for differences among students. Values such as tolerance, mutual respect, and the cultivation of mutual understanding are central to the learning process. Beyond merely understanding ethnic, racial, cultural, and religious diversity, multicultural education embraces openness as its foundation. In the curriculum, the amalgamation of multicultural education with other subjects is a crucial step toward creating a holistic learning environment and ensuring profound comprehension of the intricacies of societal diversity (Akhiruddin, 2021).

The author proposes the integration of euphemism into multicultural education for Indonesian schools in Malaysia, focusing on two key aspects:

1) Euphemism in Teaching Materials

Euphemism can be seamlessly incorporated into the teaching materials of Indonesian schools in Malaysia. A creative infusion of euphemisms into educational resources serves as an effective means of imparting lessons on language diversity and meaning. This approach allows euphemism to play a role in discussions addressing sensitive or taboo issues related to the cultural diversity of Indonesia, Malaysia, and other nations. Moreover, euphemisms can serve as engaging elements in vocabulary acquisition. By introducing euphemisms into teaching materials, students not only broaden their vocabulary, but also acquire a profound understanding of the nuanced selection of words for subtle communication of meaning. For instance, euphemistic contexts may involve the use of words or phrases to replace direct expressions that may come across as impolite or rude. Equipped with vocabulary inclusive of euphemisms, students are better equipped to communicate with sensitivity in everyday situations, fostering the development of more sophisticated language skills. Prior research has demonstrated the feasibility of incorporating additional elements into teaching materials to support multicultural education (Azkiya et al. 2022; Kamil et al. 2022).

2) Euphemism Integrated Into Speaking Skills

Euphemisms have proven to be a highly effective communication strategy for students across diverse contexts. First, they uphold honor and sensitivity by conveying messages or information that might be perceived as unpleasant or sensitive in a more nuanced manner. This not only preserves honor but also diminishes the potential for conflict or discomfort. Second, euphemisms function as a means of

sidestep discomfort or conflicts. In social and professional settings, they are frequently employed to steer clear of potential discomfort or conflict arising from the use of overly sharp or direct language. Third, euphemisms facilitate empathetic communication, contributing to the creation of a warmer and better understanding of the communication atmosphere. Their usage reflects a consideration of others' feelings, fostering a space for open dialogue. Finally, euphemism plays a role in delivering unfavorable news. When conveying bad news, euphemisms soften the emotional impact, rendering the message palatable. Employing euphemisms as part of a language skills strategy aligns with Puspidalia's (2018) research, which emphasizes the importance of politeness. In communication, language users frequently resort to euphemisms to respect other parties and avoid communication taboos because euphemisms generally carry multiple associative meanings. Even in language activities, individuals need to be mindful of the politeness aspects to minimize misunderstandings and ensure that communication partners feel at ease and comfort.

What Drives the Imperative of Euphemisms in Multicultural Education?

The incorporation of euphemism into the framework of multicultural education for Indonesian schools in Malaysia is driven by the urgent need to foster an inclusive and respectful learning environment. Considering the multicultural context of Indonesian schools in Malaysia, the application of a more subtle and sensitive language allows students to cultivate positive dialogue among diverse cultures coexisting in the school environment. Choosing soft and polite words with a focus on respecting diversity enables students to circumvent potential conflicts or discomfort stemming from variations in cultural backgrounds and values. Furthermore, euphemism plays a pivotal role in establishing a

better understanding between students and teachers, creating an environment conducive to the exchange of ideas and experiences. Consequently, a profound understanding of the urgency of euphemisms can serve as the foundation for constructing an inclusive educational community that upholds differences and nurtures mutual respect between students and educational staff.

The significance of euphemism in multicultural education within Indonesian schools in Malaysia aligns with the essence of euphemism itself. Rooted in Greek, euphemism translates to 'Wellspeaking,' signifying the practice of using language that sidesteps rudeness, taboo, impoliteness, and instead engages in pleasant, polite, and gentle discussions. Euphemisms are crafted to foster a positive communication image that is intricately linked to social karma (Khairani, 2023; Fatahilah, 2023). The use of euphemisms holds particular importance in daily life, especially in language usage, as many individuals may struggle to discern the boundaries between languages considered soft or rude, particularly among children who might inadvertently use impolite language towards their parents and others. The adoption of euphemisms helps to designate certain words as taboo or harsh (Winata & Nasihin, 2023; Puspitasari et al., 2019). Euphemisms serve multiple functions, including protective euphemisms that shield and prevent offense; cunning euphemisms designed to perplex and mislead; enthusiastic euphemisms that incite passion and exaggeration; provocative euphemisms expressing ideas and inspiring; cohesive euphemisms demonstrating solidarity and helping define groups; and ludicrous euphemisms intended for enjoyment and entertainment (Burridge, 2012).

Integrating euphemism into multicultural education within Indonesian schools in Malaysia is imperative, aligning with the enhancement of interpersonal skills. One crucial interpersonal skill contributing to multicultural competence is the ability to partake in constructive discussions with individuals with divergent perspectives (Borge, 2022). Notably, multicultural education extends beyond linguistic considerations, intertwining various facets, including culture (Tien, 2023). Moreover, multicultural education plays a pivotal

role in enhancing students' comprehension of the intricate dynamics within diverse cultures, encompassing the intersectionality of race, gender, class, and exclusion. This multifaceted approach aims to emancipate students from oppressive structures prevalent in society.

Conclusions

Indonesian schools in Malaysia require enhancements in the realm of multicultural education, particularly given the inherently multicultural context of the educational setting. These schools ought to take proactive measures to enhance multicultural education by developing a more inclusive curriculum, facilitating interactions among students from diverse cultural backgrounds, and integrating euphemism to cultivate a tolerant learning atmosphere. Consequently, the author introduced the concept of euphemism-based multicultural education, which can be integrated into two key facets: teaching materials and speaking skills. The urgency of incorporating euphemisms in multicultural education serves as a foundational element in constructing an inclusive educational community, fostering respect for differences, and nurturing mutual respect within the school community through subtle nuances of language. Through the prioritization of multicultural education, Indonesian schools in Malaysia have the potential to emerge as pioneers in nurturing a generation that not only excels academically, but also possesses a profound understanding and respect for cultural differences.

It is crucial to note that this study does not aim for generalization, but endeavors to provide a broad overview of the imperative of euphemism in multicultural education within Indonesian schools in Malaysia. Consequently, the author encourages other researchers to explore and develop multicultural education based on euphemisms and other aspects to support Indonesian schools in Malaysia. As an initial step, this study underscores the urgency of integrating euphemisms as a fundamental element in creating an inclusive learning environment attuned to cultural diversity.

However, the author acknowledges the existence of numerous other facets of multicultural education that necessitate further exploration and development. Therefore, recommendations have been extended to reviewers and researchers to broaden the scope of the study to encompass various dimensions. The aspiration is that these collective efforts will establish a more comprehensive and effective foundation for the advancement of multicultural education in Indonesian schools in Malaysia, fostering a learning atmosphere that champions an understanding, tolerance, and respect for cultural differences.

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