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Educational Views on The Use of ChatGPT: Research was Conducted on Teachers

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***Abstract*— Artificial intelligence technology is growing rapidly in various fields, including education. One of the artificial intelligence technologies that can be utilized in learning is ChatGPT. ChatGPT can be used in schools to help students learn in a more interactive and interesting way. The purpose of this study was to determine the teachers' views on the use of ChatGPT in the learning process. The method used in this research is a qualitative method, data obtained through distributing questionnaires conducted online. The results of this study indicate that educational views on the use of ChatGPT are very influential on the learning process and increase the confidence of students. The conclusion of this study explains that the ability of ChatGPT artificial intelligence technology determines how active students are in learning. The limitation in this study is that researchers only conducted research on educational views on the use of ChatGPT: The research was conducted on teachers even though there are still many technologies that can be used as alternatives in improving student learning. Researchers hope that there will be similar studies that examine other learning. Researchers also recommend that this research can be used as a benchmark and make a reference for further research.**

***Keywords*— Education, ChatGPT Usage, Teacher**

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I. INTRODUCTION

Education is constantly evolving and changing with the times and learning itself (McPherson, 1995). In life, it is very important to improve education, especially in today's digital era, technology affects students' learning in terms of progress and success (Lauer, 2021). Therefore, it is important for students or teachers to understand the role of education in this digital era and how

teachers can ensure all students have access to proper and quality education (Fowler et al., 2020). To understand the importance of education, students must be able to earn or score high grades (Alam et al., 2020). Education also helps students develop knowledge and skills and broaden their horizons through continuous learning (Reiter, 2020). This education not only concerns the present, but also affects the future. Therefore, it is necessary to know what can be learned in this era of technology-based education.

Artificial intelligence seeks to conversation-like software with people in the right language through messages, e.g. GPT (Generative Pre-Trained Transformer) open technology which is very popular for artificial intelligence. Understanding and response is provided in the form of natural language and machine learning (Yannakakis & Togelius, 2018). This chatGPT technology can answer almost any real-world case, such as (Richardson et al., 2018): Customer service, information services, personal support and more Advancements can be classified into websites and mobile apps that pass between the web (Baeza-Yates, 2018). The simplest tasks involve answering general questions from the public, students or teachers (Bakker & Albrecht, 2018), while better tasks include giving personal advice, translating into context or chat grammar GPT has great power to motivate researchers and libraries in a responsible way to improve the quality of work (Bakker & Albrecht, 2018), creating scientific knowledge (Bueno Salinas, 2019), and educate future thinking.

ChatGPT technology has many advantages such as the ability to optimally understand questions and provide answers effectively. In addition, this technology also has many advantages in the world of Education (Dunn et al., 2018), namely:1. Flexible language style. ChatGPT not only provides answers to users' questions, but is also designed to follow the speech style of a typical person. This allows users to have a new experience of asking a bot, but with flexible answers, just like when asking people. 2. Benefits of the times. Simply enter the topic or gist of the question you want answered, and the bot will instantly answer the question within seconds (Weston & Frieman, 2020). 3. Easy to use. It can be used by everyone including students and teachers (Siegel et al., 2020). Type the command as needed, the chat will automatically explain things more simply and concisely (Weston & Frieman, 2020). 4. Multiple functions can be performed. ChatGPT can also multitask, answer questions, generate random text, fix bugs and more. so the user's work becomes more efficient as this app allows him to do several things at once (Burger, 2022). 5. The data is large enough that GPT has trained millions of texts from the web.

Educational technology has evolved in recent years, affecting both students and teachers (McMillan & Zeufack, 2022). Technology has a positive impact on learning resources, motivating students and creating more engaging learning. (Dalmat, 2021). Teachers' understanding of these techniques can be used as a learning tool for students. Educational technology can also offer teachers tremendous opportunities to enhance student learning in more engaging ways (Dalmat, 2021). Teachers should ensure more effective learning outcomes when using this technology judiciously to achieve the desired value for students (F. Wang et al., 2021). Technology also plays an important role in this Covid-19 era, where activities are carried out online or online, because students can actively think and act according to these technological developments in the learning provided by the teacher.

Currently, the scientific community is aggressively discussing the use of artificial intelligence in the academic world. So far, little is known about the effectiveness in producing, promoting, and designing high-quality research papers in the direction of the research field. This research study, we hypothesized that GPT permission to co-author using GPT in general and public research specifically, health research may offer a variety of benefits, including efficiency of inclusion, collaboration, and accessibility. This study served several purposes: First, it explores the capabilities and functions of GPTs to advance public health research (Laronha & Caldeira, 2020). Secondly we ourselves used the open al model to produce most of the manuscript as co-authors and solicited feedback on that area of research. Third, based on the GPT reform of domain-specific recommendations, we can learn lessons for future thesis generation and suggestions for scientific discussions on scientific collaboration with artificial intelligence.

ChatGPT makes good writing with the right arrangement, the world of education will also respond (Kickbusch et al., 2020). The Los Angeles Unified School District blocked access to the GPT open chat website on school networks or devices in its area on December 12, 2022. This was followed by the York City Education Code at the end of December 2022, making the same applicable to schools in their area. The reason for the breach suggests that using ChatGPT supports problem-solving and critical thinking skills. Students are the capital of academic and lifelong success (McMillan & Zeufack, 2022). Professor of philosophy at Northern Michigan University, a different view (F. Wang et al., 2021). A professor named Antony Aumann believes that the rate of development of tools like ChatGPT is very large even though there are also tools to detect typing done by open al, it still cannot keep up with the rate of development of programs like ChatGPT. ChatGPT work on prohibition is not because of its highly structured and highly consistent text.

Another similar incident happened to a philosophy professor named Darren Hick from Furman University in Greenville, South Carolina (Fowler et al., 2020). Considered his students' writing to be better than that of 18th century philosopher David Hume, but his writing structure was similar to that of open al. Then verifying it by writing an appropriate prompt one would expect the ChatGPT to give a similar response to the students' work. The result is that the two have up to 99.9% similarity. Learn more about the general understanding especially in education using ChatGPT, the leading online course provider, study.com conducted a survey of 100 teachers in January 2023 and 1000 students over the age of 18 about the use of ChatGPT in schools (perception of ChatGPT in schools) (Inagaki et al., 2018). 72% of college professors are concerned with students using ChatGPT to cheat, but only 58% of school teachers are concerned about it. About 34% of all professors and faculty want to ban the use of GPT chats in colleges or schools. However, more 66% support granting usage rights to ChatGPT. In contrast, 72% of students support blocking access to GPT chats on campus networks. 48% of students use GPT chat to take exams at home, 53% and 22% use it to write essays while sketching (Thai-Nghe & Sang, 2022). For the author, the existence of ChatGPT technology is used for education in Indonesia, especially countries that want to develop students' skills. The six competencies that they must have in education are critical thinking, collaboration, communication and creativity combined with two other supporting competencies, namely character and citizenship education (Fourcade, 2021). According to the author, skills can be acquired and developed unintentionally. Should be able to understand when now students are still weak in written writing (Hogan et al., 2022). This is based on the idea that the authors tried with ChatGPT to show that the messages generated by ChatGPT can be used or utilized in the learning process of students.

These objectives may vary depending on the type of research being conducted. Some general objectives of this research are (1). Describe or explain phenomena: that is, to better understand a particular phenomenon or event. (2). Test the relationship between two or more variables: to test whether there is a relationship between two or more variables and how strong the relationship is. (3). Confirm the effectiveness of an intervention: to test whether a particular intervention or activity is effective in achieving a particular goal. (4). Test a hypothesis or theory: to test and prove or disprove a particular hypothesis or theory (Chowdhary, 2020). (5) Making recommendations or taking action: Produces information that can be used to make specific recommendations or actions. any type of research to gain new knowledge or information that can be used to improve understanding or solve existing problems.

The importance of research is made because GPT technology research is becoming increasingly developed in various fields of life, including business, education, and health. ChatGPT itself is a type of chat that uses natural language processing technology to generate near-human-like responses (Y. Wang et al., 2020). Studying GPT conversations can provide a better understanding of how this technology works and how it can be used effectively in various applications. Research on ChatGPT can help develop advanced chatbot technologies that can help improve business and organizational efficiency and provide better and more responsive customer service (Y. Wang et al., 2020). In addition, research on GPT technology can help improve the ability of machines to better understand human language, which can be used in many other applications such as search engines and

word processors (Trivedi et al., 2020). In GPT conversation research, researchers can explore various aspects of technology, such as chatbot architecture, natural language techniques, and natural language processing model development. Researchers can also familiarize themselves with various ChatGPT applications, such as chatbots for customer service, chatbots for mental health support, and chatbots for training. In conclusion, the study of GPT is essential for the development of more advanced and natural language processing techniques that can help improve efficiency and services in many areas of life (Sagi & Rokach, 2018). Research on ChatGPT should be continued to develop better and more responsive technology for users.

Interest in the title "educational views on the use of ChatGPT: Research conducted by teachers" to learn more about education's views on the use of ChatGPT, including the benefits and challenges of its use (Trivedi et al., 2020). This study used a qualitative approach with data collection techniques and interviewed 10 teachers and conducted direct classroom observations using GPT conversations. The data obtained were then analyzed using qualitative analysis methods. The results of the study are expected to reveal positive or negative educational views about learning using ChatGPT as well as the benefits and challenges of its use. As a teacher or prospective teacher, understanding education from technology such as ChatGPT can help design and implement more effective and relevant lessons for students (Ting et al., 2020). Using ChatGPT can help students better understand language concepts and improve their language skills. Knowing how the use of ChatGPT should be organized and monitored to have a positive impact on students and the overall learning process (Friston et al., 2021). Therefore, this title is very interesting and provides useful insights into developing more innovative and effective student learning.

II. Research Methods

The use of technology in learning has become more common these days. One area of concern is the ChatGPT natural language model developed by open aI (Gómez-Pradas, 2022). This model can help teachers in classroom learning, especially in writing and language use (parkdongwoo, 2022). Therefore, it is crucial to explore the educational perspectives of using GPT talk for teachers. The research methods used to investigate teachers' educational views on using GPT talk can vary. The methods used should be appropriate to the purpose and focus of the research. Some of the methods used include literature studies, case studies, surveys, observations and interviews. The researcher should choose the method that best suits the purpose and focus of the research being conducted (McPherson, 1995). Literature review is a research method that uses sources such as magazines, books and articles to obtain information about the use of ChatGPT in education. This literature review can provide insight into the use of ChatGPT in teaching and its impact on teacher learning.

Some literature studies show that the use of ChatGPT can help teachers in creating more diverse and interesting teaching materials. In addition, ChatGPT can also help teachers provide feedback to students more effectively (Bueno Salinas, 2019). However, there are also some problems in using ChatGPT, such as lack of control over ChatGPT output and concerns about the accuracy of ChatGPT output. A case study is a research method that selects several teachers who have used ChatGPT in their teaching. In this case study, the researcher can analyze these teachers' experiences in using GPT chat and its effectiveness in improving the quality of learning. Some case studies show that using ChatGPT in teaching can help teachers prepare better and more effective teaching materials. In addition, using ChatGPT can also help teachers provide faster and more effective feedback to students. However, the use of ChatGPT can also reduce direct interaction between teachers and students which can affect the quality of learning. Survey is a research method that collects data through questionnaires or structured interviews to obtain teachers' opinions on the use of ChatGPT in teaching (Unke et al., 2021). This study can provide information on how many teachers use ChatGPT for what purposes they are used, and how effective ChatGPT are in improving the quality of learning (Schloter et al., 2018). Several studies have shown that the majority of teachers say that using the ChatGPT helps them prepare teaching materials.

III. RESULT DISCUSION

The utilization of ChatGPT technology is carried out by teachers in the world of education. Education is a step to create a generation that has high intelligence to create progress. Education can facilitate the achievement of life goals that will change generations of human life into positive things. Then the change will occur if the training can be done correctly. The presence of technology can bring changes at this time, especially in the world of education, the role of teachers in the utilization of technology is very important, where teachers must better understand the application of technology, teachers must know the benefits and know the use of technology. Utilization of technology in the teaching and learning process. So that learning in this way seems easier and understood by students, and students are not bored and bored when following learning for maximum results (Merry, 2020). The development of technology in education brings benefits to the teaching and learning process, education through technology has become a necessity that cannot even be separated from one another. The benefits of technology are not only felt by teachers and students, but by everyone who has witnessed the development of technology.

It can be seen that the advantages of technology for teachers are that it can help teachers get various sources of teaching materials, does not complicate the teacher's teaching process both at school and at home, makes it easier for teachers to assign their own teaching materials in learning a more efficient and effective process (Committee on Protecting Critical Technologies for National Security in an Era of Openness and Competition et al., 2022). Technology also has benefits for students, namely facilitating understanding of the material provided by the teacher, encouraging and preventing boredom and making students aware of the learning process, facilitating communication with teachers about education. That is why technology plays an important role in the world of education, especially in learning which can reduce the time needed by a teacher in explaining learning at school. The presence of technology is needed in various fields of life, especially in the teaching and learning process (Glăveanu, 2018). With the help of learning technology, learning is no longer hindered by place, time or distance. The educational process takes place not only in the classroom, but also at home. This greatly facilitates teacher and student learning, the advantages of technology are very real in the world of education, so that it can support learning effectively and efficiently (Karniadakis et al., 2021). Therefore, technology plays an important role in today's world of education, because technology facilitates the teaching and learning process of teachers in the classroom, so that students understand the material delivered by the teacher, increase students' creativity and ability to understand material from the teacher.

Table 1.1 results of questionnaire distribution

No.	Question	Answer			
		Strongly agree	agree	Disagree	Strongly disagree
1.	Using ChatGPT can improve understanding of the material being taught.	34%	64%	2%	0%
2.	With the ChatGPT technology, students are now lazy to write.	14%	54%	30%	2%
3.	Parents must supervise their children in using ChatGPT technology.	28%	66%	6%	0%
4.	Using ChatGPT can result in higher student grades	14%	72%	12%	2%
5.	The use of ChatGPT in education requires special attention to data security and student privacy	30%	64%	4%	2%

6.	The use of ChatGPT should be used wisely as a tool not a substitute for human interaction	36%	62%	2%	0%	12.	The use of ChatGPT can help improve student writing skills	22%	54%	22%	2%
						13.	The use of GPTchat can help improve time efficiency in providing feedback to students	16%	78%	6%	0%
7.	Teachers should remain an important factor in the learning process and ChatGPT is only a tool.	36%	54%	8%	2%	14.	The use of ChatGPT can increase student motivation in learning	28%	60%	10%	2%
8.	The use of ChatGPT may reduce students' understanding in the learning process	14%	48%	36%	2%	15.	The use of ChatGPT can increase student understanding in learning	22%	66%	10%	2%
9.	The use of ChatGPT should still be closely monitored by teachers at school	26%	68%	6%	0%	16.	The use of ChatGPT technology can help improve student grades.	18%	72%	8%	2%
10.	The use of ChatGPT can eliminate social interaction between students and teachers	18%	44%	34%	4%	17.	The use of ChatGPT can make students disrespect teachers in learning	14%	52%	26%	8%
						18.	The use of ChatGPT really helps speed up the process of providing feedback by teachers	16%	68%	16%	0%
11.	The use of GPTChat during covid 19 can disrupt students' concentration and focus on learning	18%	42%	38%	2%	19.	The use of	24%	42%	32%	2%

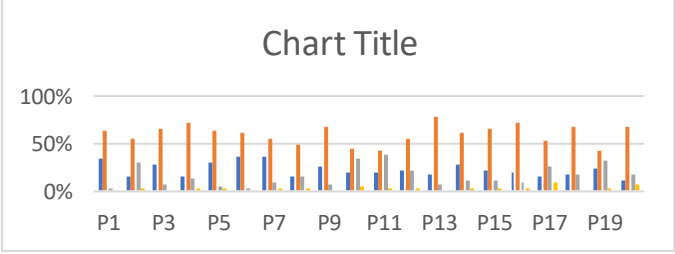
	ChatGPT can replace the role of teachers in providing good education				
20.	ChatGPT technology can replace the important role of grammar that students learn in the curriculum	10%	68%	16%	6%

The table above presents several questions about educational views on the use of ChatGPT for teachers. The importance of using technology for teachers in teaching can be seen from the questions that arise from some of these questions. What kind of technological developments are indistinguishable in the teaching and learning process, because they offer advantages that can improve the quality of teaching, as a tool that helps teachers and students learn actively, avoid boredom with learning and facilitate understanding of educational materials, especially students. This researcher tested 20 questions that included technology questions that can help teachers and students achieve learning goals in the teaching and learning process. Questions that included the need for technology for teachers in the teaching and learning process received an agreement rate of 71.9%. 71.9 percent agreed with the statement that the presence of technology increases teachers' enthusiasm and willingness to teach. The study also looked at technology so that teachers do not get bored explaining lessons in class, getting a 70% rate. The researcher's claim that the use of technology makes it easier for teachers to achieve their learning goals, the acceptance category reached 69%.

From the statements presented in this study, it can be seen that technology is perceived as unnecessary in the teaching and learning process and the class disagrees, resulting in a percentage for the disagree category of 64.9%. Similar to other statements in the consensus category, the table shows that teachers should understand technology from different perspectives to improve the teaching and learning process, with an acceptance score of 64.3%. The statement that technology exists to help teachers gather learning materials had an agreement rate of 62.5%. The statement that technology makes it easier for teachers to communicate with both students and parents, the percentage who agreed was 61.4%. A percentage of 59.6% disagreed with the statement that Islamic religion teachers rely heavily on technology in learning.

Statements containing technology help teachers to be more creative, innovative in adding to learning with the same percentage, namely. 59.6% agreed. The statement given If no technology makes it difficult for teacher training and learning both at school and at home, the percentage of 58.9% agreed. 57.1% agreed with the statement that technology allows teachers to search for educational references to develop their teaching methods. Also, 56.1 percent agreed with the statement that the use of technology can facilitate a teacher's ability to acquire or deliver educational materials. The statement about technology being beneficial to teachers, increasing understanding and knowledge with a percentage of 54.4%, achieved an acceptable score. The statement about technology playing an important role in delivering teacher learning in the classroom, 54.4% agreed. The claim that technology discourages teachers from explaining classroom learning does not fit this category 52.6. The statement that technology greatly affects the quality of teacher learning in education, 50.9% agreed. The statement that the existence of technology makes teachers lazy to teach and always rely on technology, 50% disagreed. 44.6% agreed with the statement that technology makes teachers look for learning materials more from cellphones than from books. The statement said that many teachers neglect their teaching because of technological developments, 36.8% agreed.

Diagram 1.1 Educational views on the use of ChatGPT by teachers



The diagram above explains that the survey used 20 questions about educational views on the use of ChatGPT on teachers which aims to improve the teaching and learning process by using technology. Technology also makes it easier for teachers and students to achieve learning goals so that the learning process can take place effectively and efficiently. The questions that agree out of 20 questions, namely 1, 2, 3, 5, 6, 7, 9, 12, 14, 15, 16, 17, 19, 20 are the highest. 71% percentage score. And the second highest was in questions 4, 8, 10, chatGPT 11, and there was 65% disagreement in the class. (Y. C. Wang & Egner, 2022). The next result in terms of percentage is 43% strongly agree. Thus, the largest data set was in the agree category and the smallest was in the strongly disagree category.

The information from the results of the researcher's pilot test on the educational views of ChatGPT technology on teachers can be explained that in the same class, the highest primary data collection was 71% in 16 questions, and the data collection in the two agree categories was 70% in 16 questions. 65 percent of the two dissenting categories received data, with the least amount of data collected by the dissenting category at 59 percent (Hillmann et al., 2018). The percentage results of the three categories are very similar with a percentage of 43%, the lowest with 41%. The percentage results of the four categories are very different, namely the percentage of the lowest 13 data obtained when the percentage is 0%. This conclusion is based on the results of respondents' answers, namely 20 questions about increasing competence in terms of educational technology which aims to develop technology used as a learning environment in such a way that education. this goal is achieved by improving the effective teaching and learning process. 71% of teachers agree with the statement that increasing teacher competence in terms of educational technology is the greatest, while there are 8% of teachers who strongly disagree with the statement.

The characteristics of teacher improvement in terms of educational technology are the ability to help teachers support the teaching and learning process, the ability to understand teaching materials well for students and increase the enthusiasm and creativity of teachers in continuous learning. The process of learning the advantages and disadvantages of using technology in the learning process. The utilization of technology in education has a positive effect, namely it can facilitate information by teachers and students, increase understanding and knowledge related to educational materials, so that students are not bored following the teaching and learning process. The disadvantage of using technology in the learning process is that it must rely on a stable internet network. If the network connection is not good, the learning process will not run smoothly so that students find it difficult to understand the material delivered by the teacher.

Figure 1.1 Forms of technological development

The picture above is one form of technological development that can be used in the teaching process of Islamic religious education to improve the quality of teaching. Where with the existence of technology can help teachers and students achieve learning goals, one of which is to facilitate access to sources, learning materials, facilitate communication between teachers and students, and focus students' attention on understanding the material presented to avoid student boredom during continuous learning. Therefore, teachers must be creative in utilizing technology in learning, how to generate motivation that can increase students' interest and learning ability. So that technological developments can be utilized by both teachers and students as needed. However, this research only focuses on questions addressed to teachers, because this research is related to educational views on the use of ChatGPT in teachers, so it is certain that the use of technology is addressed to teachers.

The findings of this study are the utilization of technology to improve the quality of teaching by teachers where technological developments can provide benefits to the world of education so that technology cannot be separated in the teaching and learning process. because technology more easily supports the achievement of learning objectives,

namely making it easier for teachers and students to find unfamiliar material, the learning process is accelerated both in class and at home, and teachers can use technology so that students are not bored when learning takes place. In addition, technological advances in education can improve student learning outcomes by allowing teachers to test students' ability to understand the learning being demonstrated. In order for a teacher to master technology in learning that can generate enthusiasm for learning in students, it must have a high curiosity to find learning that is difficult to understand. In this way, teachers can help students understand the material so that learning outcomes achieve the desired goals.

The study looks at the benefits of technological advances in education or not. Where technology is very useful in teaching and even the advancement of the times, namely the technology of the times that cannot be separated in teaching and learning activities. Because technology is beneficial to education. Apart from the fact that technological advances in teaching can help teachers and students in mastering difficult material, it can also improve student learning outcomes and increase student enthusiasm and achievement in learning. However, many students have difficulty in understanding the learning that takes place, because the learning that takes place with help is explained by the teacher's ignorance of technological developments, which means that teachers do not use technology in teaching, teachers lack creativity. technology. So that it can complicate the understanding of the material explained by the teacher, so that students become bored and the material conveyed to students does not go well. Therefore, teachers must know the development of the era, one of which is the technology used in learning, teachers must be more familiar with technology which will provide direction and guidance to students to learn. Thus, in the world of education, the role of teachers is very important to create an interesting learning atmosphere, by utilizing technology in such a way as to support effective teaching and learning.

The purpose of the research is to facilitate the achievement of teacher and student learning goals by utilizing the times, one of which is technology. Where teachers can use technology to think creatively in learning, one of which is a teacher who motivates by showing pictures or videos during learning, which can increase students' enthusiasm for learning. This students easily absorb the lessons explained by the teacher. because the use of technology in the teaching and learning process affects the progress of teaching so that technology finds references and learning materials and facilitates the delivery of teaching materials to students so as to increase students'

IV. CONCLUSION

Educational views towards the use of technologies such as ChatGPT in an educational context have been the subject of growing debate. Research on teachers shows mixed views. Some see great potential in using this technology to widen accessibility and provide students with a more personalized learning experience. They believe that ChatGPT can be an effective tool for facilitating discussions, providing feedback and providing individualized assistance to students. However, others expressed concerns about security, reliability and its impact on students' ability to develop critical and social skills. Overall, though, educational views towards the use of ChatGPT in learning highlight the need for a careful and balanced approach, which integrates this technology well into wider learning strategies.

V. REFERENCES

Bakker, A. B., & Albrecht, S. (2018). Work engagement: Current trends. *Career Development International*, *23*(1), 4–11. https://doi.org/10.1108/CDI-11-2017-0207

Bueno Salinas, M. (2019). Educar para la Democracia. *Revista de Educaci*[?]*n y Derecho*, *20*. https://doi.org/10.1344/REYD2019.20.30023

Burger, W. (2022). Die teks as ’n etiese aanspraak. *Tydskrif Vir Letterkunde*, *59*(3), 15–26. https://doi.org/10.17159/tl.v59i3.14319

Chowdhary, K. R. (2020). *Fundamentals of Artificial Intelligence*. Springer India. https://doi.org/10.1007/978-81-322-3972-7

Dalmat, Y.-M. (2021). Résultat positif d’un traitement de la myasthenia gravis généralisée. *Option/Bio*, *32*(639–640), 13. https://doi.org/10.1016/S0992-5945(21)00191-4

Dunn, D. T., Copas, A. J., & Brocklehurst, P. (2018). Superiority and non-inferiority: Two sides of the same coin? *Trials*, *19*(1), 499. https://doi.org/10.1186/s13063-018-2885-z

Fourcade, M. (2021). Ordinal citizenship. *The British Journal of Sociology*, *72*(2), 154–173. https://doi.org/10.1111/1468-4446.12839

Fowler, D., Brimblecombe, P., Burrows, J., Heal, M. R., Grennfelt, P., Stevenson, D. S., Jowett, A., Nemitz, E., Coyle, M., Liu, X., Chang, Y., Fuller, G. W., Sutton, M. A., Klimont, Z., Unsworth, M. H., & Vieno, M. (2020). A chronology of global air quality. *Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences*, *378*(2183), 20190314. https://doi.org/10.1098/rsta.2019.0314

Friston, K. J., Da Costa, L., & Parr, T. (2021). Some Interesting Observations on the Free Energy Principle. *Entropy*, *23*(8), 1076. https://doi.org/10.3390/e23081076

Glăveanu, V. P. (2018). Educating which creativity? *Thinking Skills and Creativity*, *27*, 25–32. https://doi.org/10.1016/j.tsc.2017.11.006

Gómez-Pradas, M. (2022). Club 49, una ventana abierta al descubrimiento de la cultura japonesa. *Arte, Individuo y Sociedad*, *34*(3), 1113–1132. https://doi.org/10.5209/aris.77190

Hillmann, B., Al-Ghalith, G. A., Shields-Cutler, R. R., Zhu, Q., Gohl, D. M., Beckman, K. B., Knight, R., & Knights, D. (2018). Evaluating the Information Content of Shallow Shotgun Metagenomics. *MSystems*, *3*(6), e00069-18. https://doi.org/10.1128/mSystems.00069-18

Hogan, A., Blomqvist, E., Cochez, M., D'amato, C., Melo, G. D., Gutierrez, C., Kirrane, S., Gayo, J. E. L., Navigli, R., Neumaier, S., Ngomo, A.-C. N., Polleres, A., Rashid, S. M., Rula, A., Schmelzeisen, L., Sequeda, J., Staab, S., & Zimmermann, A. (2022). Knowledge Graphs. *ACM Computing Surveys*, *54*(4), 1–37. https://doi.org/10.1145/3447772

Inagaki, M., Toyoda, M., Soneda, Y., & Morishita, T. (2018). Nitrogen-doped carbon materials. *Carbon*, *132*, 104–140. https://doi.org/10.1016/j.carbon.2018.02.024

Karniadakis, G. E., Kevrekidis, I. G., Lu, L., Perdikaris, P., Wang, S., & Yang, L. (2021). Physics-informed machine learning. *Nature Reviews Physics*, *3*(6), 422–440. https://doi.org/10.1038/s42254-021-00314-5

Kickbusch, I., Leung, G. M., Bhutta, Z. A., Matsoso, M. P., Ihekweazu, C., & Abbasi, K. (2020). Covid-19: How a virus is turning the world upside down. *BMJ*, m1336. https://doi.org/10.1136/bmj.m1336

McMillan, M., & Zeufack, A. (2022). Labor Productivity Growth and Industrialization in Africa. *Journal of Economic Perspectives*, *36*(1), 3–32. https://doi.org/10.1257/jep.36.1.3

McPherson, H. (1995). *A Political Education: A Washington Memoir*. University of Texas Press. https://doi.org/10.7560/751811

Merry, M. S. (2020). Can schools teach citizenship? *Discourse: Studies in the Cultural Politics of Education*, *41*(1), 124–138. https://doi.org/10.1080/01596306.2018.1488242

parkdongwoo. (2022). The existence of a bundled CT head in Bahasa Indonesian. *Linguistic Research*, *39*(2), 297–326. https://doi.org/10.17250/KHISLI.39.2.202206.003

Reiter, B. (Ed.). (2020). *Constructing the Pluriverse: The Geopolitics of Knowledge*. Duke University Press. https://doi.org/10.1515/9781478002017

Richardson, K., Fox, C., Maidment, I., Steel, N., Loke, Y. K., Arthur, A., Myint, P. K., Grossi, C. M., Mattishent, K., Bennett, K., Campbell, N. L., Boustani, M., Robinson, L., Brayne, C., Matthews, F. E., & Savva, G. M. (2018). Anticholinergic drugs and risk of dementia: Case-control study. *BMJ*, k1315. https://doi.org/10.1136/bmj.k1315

Sagi, O., & Rokach, L. (2018). Ensemble learning: A survey. *WIREs Data Mining and Knowledge Discovery*, *8*(4). https://doi.org/10.1002/widm.1249

Schloter, M., Nannipieri, P., Sørensen, S. J., & van Elsas, J. D. (2018). Microbial indicators for soil quality. *Biology and Fertility of Soils*, *54*(1), 1–10. https://doi.org/10.1007/s00374-017-1248-3

Siegel, R. L., Miller, K. D., & Jemal, A. (2020). Cancer statistics, 2020. *CA: A Cancer*

Journal for Clinicians, *70*(1), 7–30. https://doi.org/10.3322/caac.21590

Thai-Nghe, N., & Sang, P. H. (2022). A Session-Based Recommender System for Learning Resources. In T. K. Dang, J. Küng, & T. M. Chung (Eds.), *Future Data and Security Engineering. Big Data, Security and Privacy, Smart City and Industry 4.0 Applications* (Vol. 1688, pp. 706–713). Springer Nature Singapore. https://doi.org/10.1007/978-981-19-8069-5_51

Ting, D. S. W., Carin, L., Dzau, V., & Wong, T. Y. (2020). Digital technology and COVID-19. *Nature Medicine*, *26*(4), 459–461. https://doi.org/10.1038/s41591-020-0824-5

Trivedi, P. C., Bartlett, J. J., & Pulinilkunnil, T. (2020). Lysosomal Biology and Function: Modern View of Cellular Debris Bin. *Cells*, *9*(5), 1131. https://doi.org/10.3390/cells9051131

Unke, O. T., Chmiela, S., Sauceda, H. E., Gastegger, M., Poltavsky, I., Schütt, K. T., Tkatchenko, A., & Müller, K.-R. (2021). Machine Learning Force Fields. *Chemical Reviews*, *121*(16), 10142–10186. https://doi.org/10.1021/acs.chemrev.0c01111

Wang, F., Harindintwali, J. D., Yuan, Z., Wang, M., Wang, F., Li, S., Yin, Z., Huang, L., Fu, Y., Li, L., Chang, S. X., Zhang, L., Rinklebe, J., Yuan, Z., Zhu, Q., Xiang, L., Tsang, D. C. W., Xu, L., Jiang, X., … Chen, J. M. (2021). Technologies and perspectives for achieving carbon neutrality. *The Innovation*, *2*(4), 100180. https://doi.org/10.1016/j.xinn.2021.100180

Wang, Y. C., & Egner, T. (2022). Switching task sets creates event boundaries in memory. *Cognition*, *221*, 104992. https://doi.org/10.1016/j.cognition.2021.104992

Wang, Y., Yan, J., Wen, N., Xiong, H., Cai, S., He, Q., Hu, Y., Peng, D., Liu, Z., & Liu, Y. (2020). Metal-organic frameworks for stimuli-responsive drug delivery. *Biomaterials*, *230*, 119619. https://doi.org/10.1016/j.biomaterials.2019.119619

Weston, S., & Frieman, M. B. (2020). COVID-19: Knowns, Unknowns, and Questions. *MSphere*, *5*(2), e00203-20. https://doi.org/10.1128/mSphere.00203-20

Yannakakis, G. N., & Togelius, J. (2018). *Artificial Intelligence and Games*. Springer International Publishing. https://doi.org/10.1007/978-3-319-63519-4