

Utilization of Artificial Intelligence Technology in Research

Perspective of the Value and Norms of Researchers

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ABSTRACT

The era of the industrial revolution has entered its peak in 5.0 which is an era where humans coexist full of technology. One of them is artificial intelligence and the products it produces such as ChatGPT, OpenAI, and artificial intelligence in other fields. In this era, humans will be given all kinds of conveniences from technology. The search for truth can be done quickly but less accurately. Artificial intelligence uses big data that will continue to be filled with various knowledge so that in the end intelligence can be utilized properly. The use of artificial intelligence technology in research conducted by researchers should still follow the rules, values, and norms in research. Values and norms in research will lead researchers to be open, fair, responsible, and skeptical of research results. The research method used is a literature study conducted by finding literature sources, reading literature, selecting literature, and analyzing related literature utilizing artificial intelligence in research. The purpose of this study is to find values and norms in research that uses artificial intelligence technology. The result of this study is that a researcher must have the value of objectivity, honesty, fairness, responsibility, stewardship, and openness and continue to develop skepticism, responsibility, ease of understanding, and critical thinking behavior that researchers must have. There are advantages and disadvantages to the use of artificial intelligence in research. The advantages include reference management, search for reference sources, plagiarism checking, and discussions between researchers. While the drawback is the critical thinking ability of researchers, plagiarism, fabrication, and

falsification of research data. For this reason, good and responsible researchers must follow the values, values, and norms in research. Researchers must be responsible for the results of their research because the results of their research are a source of knowledge and will be read by readers widely.

Keywords

Artificial intelligence
Norm of researcher
Research
Value of research

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Introduction

Today, the world is introduced to the era of the Industrial Revolution 4.0 where the use of technology begins to be fully implemented in any field. The technology that is developing today is undeniably something that cannot be avoided. Man-made technology was created to help human work, but nowadays, technology can replace human work, and some jobs will also disappear as a result of innovation. [1]. Technology that is present among modern humans can be said to replace work, but some ethics cannot be done in the presence of technology. One of them is artificial intelligence (AI), they are created by humans to have intelligence independently without being run or controlled by humans. Artificial intelligence refers to the ability to think like humans but owned by machines. Intelligence involves complex, actual, and potential systems in various sectors [2].

The product of artificial intelligence that is popular today is ChatGPT which has started to step on version 4.0 with all kinds of updates and stability. The technology that is successfully developing rapidly today is also inseparable from the existence of a researcher who continues to conduct research and create various innovations, especially in the field of technology. Humans are creatures given a mind that is used to think as a learning process from the experiences they have. Through the synthesis process between reason and experience, humans can produce a science. It is this intellect that can distinguish between humans and other creatures and lead humans to know something. The curiosity that arises from humans is the origin of knowledge [3].

The definition of artificial intelligence is how to make a computer perform actions better than humans do. Because humans will experience several periods of age deterioration and various limitations that are very limited, the question is how to make humans who will not get tired and continue to think even better than humans [4]. In the research conducted [5] There is a mutual relationship in the use of information technology in managing knowledge resources. The study he conducted was conducted with a systematic literature review with the

results of many studies that have proven that technology can increase the efficiency of knowledge and also increase the competitiveness and achievement of institutions.

In the use of technology, especially artificial intelligence which is easily accessed and used, it should be done wisely, there are many impacts and risks if you cannot use it wisely. For example, cybercrime. Artificial intelligence technology can easily endanger device owners due to viruses and malware that can damage computer systems. Risk of errors and inaccuracies in writing and preparing scientific research. The main risk according to researchers is the value and norms of researchers in utilizing artificial intelligence technology [6]. In the research conducted [7]. There are threats and opportunities associated with the use of AI in the context of technology utilization in the fields of privacy, labor market, health care, and renewable energy. In the labor sector, for example, the implementation of routine, structured tasks, data recording, production work, data analysis, risk calculation, and recommendations can be replaced more quickly and efficiently and reduce the need for human involvement. In the procedural work sector, AI can help and even replace human labor, but in terms of emotional support, AI has yet to be touched.

In the research conducted [8], the implementation of AI or artificial intelligence provides very significant benefits to human life, especially in the fields of economics, health, and industry. For example, in the health sector, namely the use of AI to detect the presence of the COVID-19 virus, detect the use of masks, and measure temperature, and in the economic sector, namely seeing the development of regional to state economies, automatic delivery of goods, and so on. In the future, AI with all its breakthroughs will be even more sophisticated, therefore humans should always upgrade their knowledge and creativity.

The rapid development of AI sometimes has its pros and cons. The pro-AI development group will be greatly facilitated in the current era of the Industrial Revolution with its various conveniences. The counter group to the development of AI will 4.0 reject everything because it will shift humans themselves starting from work, education, convenience, proper things, and even research. Research ethics is defined as the way a researcher conducts research from research preparation to research publication that must be followed by the researcher. Violating research ethics will harm the results of research and the knowledge produced. Research ethics will bring researchers to be responsible for what they write. The priority of discovery and creation must continue to be carried out by a researcher only to develop knowledge, not money-oriented or even positions [9].

The ability of researchers to conduct research will affect a researcher himself problem-solving skills. This problem-solving ability over time is developed so that it is not only owned by researchers but in technology so that technology will have a contribution to help solve a

problem. The word "researcher" will refer to research, and research will refer to knowledge. Knowledge is part of the competition to build each other up, strengthen each other, connect, complement each other, and close weaknesses. Competition in research does not lead to a win-lose or even a money-loss orientation [10].

From a research point of view, artificial intelligence is the study of how to make computers do things as well as humans do [4]. This is seen as how artificial intelligence becomes a researcher who exceeds existing researchers at this time. Researchers and research may be carried out by artificial intelligence alone, but whether what is produced can be accounted for, whether it does not violate the researcher's code of ethics, and whether artificial intelligence can indeed seek the truth without making mistakes.

Research conducted by researchers will not produce something absolute (right-wrong) but use the words better, reasonable, appropriate, less good, or unacceptable. So in research, researchers strive to find the truth but will not make the results of their research right or wrong. [11]. Research is a professional activity based on prevailing values and norms. Norms are strong benchmarks/ standards used by society to measure an activity/ activity carried out by an individual or group that is correct and acceptable in society.

Norms provide ideal standards that must be adhered to so that the actions of a person or group can be well accepted in society while value is an idea that serves to direct and control a person's behavior so that they can distinguish between good and bad. In the context of research, several values must be obeyed in researching so that the results of the research have a useful contribution to the advancement of science and do not violate the applicable rules. In the book [12], there are 6 values in research rules, including Objectivity; Honesty; Openness; Accountability; Fairness; and Stewardship. The values in the research are arranged so that the research findings fulfill these values and are easily accepted by readers. Researchers must provide an objective view according to empirical data in the field. Researchers must also prioritize honesty, honest mistakes, honesty in the research process, and honesty in reporting results, research must also be accountable.

Researchers conducting research must provide fairness in providing benefits and burdens that are following the ability of the subject, not excessive, and must match field data. Researchers must also carry out research stewardship management and continue to perform community service as academics and continue to contribute knowledge to the wider community. While research norms, it is explained that there are four aspects, namely Communalism (used for many people); Universalism (research is assessed for its contribution to science regardless of who and where the research is conducted); Disinterestedness (neutral), and Organized Skepticism (critical and careful attitude) [13].

Methods

This research uses a type of literature study or library research. Library study research is carried out by reading, analyzing, and recording things related to the problems to be studied. Library research is a series of studies conducted using library data collection methods, reading recording, and processing research materials [14], [15].

Literature research uses data collection techniques in the form of documenting references which will then be analyzed through books and journals and conclusions drawn. [16], [17]. According to Ref. [18] Literature study is part of the technique of collecting data and information through books, literature notes, and various reports related to the problem to be solved. The data collection stage is carried out by preparing equipment, compiling a work bibliography, organizing time, and reading and making research notes, while the report preparation stage is carried out by filtering data and analyzing data, compiling research reports, and comprehensive examinations [19].

The literature study method was chosen by researchers to present information and personal arguments related to the norms and values of researchers in using artificial intelligence in conducting research, whether there are violations of the code of ethics and rules in using intelligence that will be supported by scientific data. The literature data collected by researchers is closely related to the utilization of artificial intelligence technology, researcher norms, research values, and the advantages and disadvantages of utilizing artificial intelligence technology in research for researchers.

Results

The use of artificial intelligence technology by researchers in research is allowed and legitimate, but researchers must still use their critical thinking skills, ability to compare, ability to ask questions and look, and understanding previous research studies. The ethical feasibility of research includes social, scientific, burden and benefit values, potential, benefits, risks, exploitation persuasion, confidentiality, and consent after explanation [11].

According to Ref. [20] in his symposium, he argued that artificial intelligence is both a boon and a bane in educational practice. With its potential to help educators, a viable and widely applicable educational development project is inevitable. The ideas expressed by Ref. [20] that relying on technology alone is a dangerous path. On technology, researchers must follow the rules of norms and values in research. Researchers must remain under their code of ethics so that the novelty of research, and accountability for research results do not lead to violations and misguidance.

A. Natural Intelligence – Artificial Intelligence

The word "artificial intelligence" was first introduced by John McCarthy in 1956 at the Dartmouth Conference which was also attended by contributors to artificial intelligence research. Artificial intelligence at that time was aimed at knowing and modeling the process of human thought processes and designing machines so that they could imitate human behavior, namely how to think [4].

The concept brought by John is that humans become smart and intelligent in solving the problems faced because of the knowledge from learning and experience that humans have. According to Ref. [4], artificial intelligence is defined as an area of research, applications, and instructions related to computerized programming in carrying out everything that in the human view is classified as intelligent. Humans are researching to create artificial intelligence that can match natural human intelligence. Natural intelligence is very much different from the development of artificial intelligence. Natural intelligence will quickly change due to the forgetful nature of humans while artificial intelligence is permanent if there is no addition of program material in it.

In natural intelligence, the process of transferring material or thought is slower from one person to another, while in artificial intelligence it will be very fast because it also utilizes the Internet of Things and the support of the latest generation of very fast networks. Natural intelligence often changes and can develop forward or backward, while artificial intelligence will be more consistent, easy to duplicate and spread. The work done by natural intelligence is still conventional and manual, while artificial intelligence will provide easy, cheap, fast, accurate work [4].

B. Ethics of Utilizing Artificial Intelligence Technology in Research

Progress continues to accelerate in the world of artificial intelligence as it jeopardizes research and education. The reason is that research can be done easily using only artificial intelligence, and education can be done easily by relying on artificial intelligence alone. The role of artificial intelligence in research should only be as a last resort and or a secondary aid that researchers choose in conducting research. Using ChatGPT for example, within seconds, the desired information can be easily obtained. Or given other tasks such as analysis, essay writing, translation, and data collection, ChatGPT can do it in seconds [21].

On the other hand, critical analysis is not possible because the big data sources in ChatGPT have not been able to perform a series of accurate critical analysis. Here the role of the researcher becomes very important and quite cannot be replaced by artificial intelligence completely. In terms of ethics in the use of artificial intelligence, research ethics will direct,

measure the extent, limit the things that can and cannot be done during and after research. Research ethicists are likened to field examiners on research results who will provide mind maintenance, critical thinking skills, evaluation, and evaluation [1].

At the beginning of the research, artificial intelligence can be used and utilized to see phenomena that have not been thought of by researchers [22]. But for the next researcher must also continue to conduct a literature review based on the initial findings on artificial intelligence tools. Researchers can also use it as an exploration of other points of view. The novelty of research is discovered quickly and the gap between theory and reality in the field can be addressed immediately through research.

C. The Value of Objectivity in Research

Objectivity is a very important value in the view of empiricism. In the scientific method based on empiricism, research is based on objective observation and testing, where the researcher tries to minimize subjective influences or personal biases. The link between objectivity and empiricism is that research should be based on facts that can be objectively observed and measured.

The value of objective research is that researchers do not bring subjective judgments that will affect the research. This value must be upheld according to empirical evidence in the field. Objectivity means that there is no particular motivation or intention that will influence the research. Researchers must be free from any pressure and influence that results in research with specific intentions. In utilizing artificial intelligence, researchers in applying the value of objectivity, researchers should not only rely on the data found by artificial intelligence tools, but researchers must conduct direct research and obtain empirical field data.

D. The Value of Honesty in Research

Honesty is an ethical value that reflects integrity in reporting research results. In the context of the empiricism paradigm, honesty is essential because research focuses on honest testing and observation of observed phenomena. Deviations from honesty can compromise the validity of research results and eliminate the empirical basis of knowledge.

The search for knowledge based on the value of honesty is based on systematic procedures that are agreed upon to determine the empirical or theoretical basis. Honesty encountered in the field will not always be easy. Dishonesty can be encountered intentionally or unintentionally, for example in the falsification of field data, in reporting, or even in writing research results [12].

Based on the use of artificial intelligence researchers apply the value of honesty in exploring research data that must be maintained and data fabrication and falsification must not occur. Honesty must also be carried out by researchers so that the implementation of research is indeed carried out in the field, not just by using artificial intelligence. Honesty should be possessed by every researcher.

E. The Value of Openness in Research

Honesty and openness are almost synonymous, but there are differences in value contexts. Openness in research relates to the transparency and presentation of research data that is relevant to research decisions and conclusions. The value of openness in research also refers to data collection, reasons for collecting data, reproduction of research data, verification of results and further development of research results. Researchers must be open to receiving input, suggestions, criticism, and skepticism from researchers.

Openness is also defined at the time after the research or at the publication of the research results. Starting from the date of receipt, revision, and publication date. In the research process, transparency is sometimes not carried out by researchers, for example falsifying data or not accepting criticism, which has an impact on unfair research results [12]. With artificial intelligence, researchers can apply the value of openness to research data, data acquisition, and honesty of research data. Openness also means that researchers know the results of their research.

F. The Value of Accountability in Research

Accountability underscores the responsibility of researchers to explain and account for their actions and decisions in research. In the view of the empiricism paradigm, accountability ensures that research is conducted correctly, follows appropriate methods, and can be verified by others. The value of accountability will require researchers to be able to demonstrate the validity of the research results.

The value of accountability will also have an impact on the trust of research assistance providers, resulting in an increased reputation as a professional researcher. With artificial intelligence, researchers must be responsible for a series of systematics in research. The value of responsibility is not only for the results of the research but also for the donor, affiliation, institution, institution, and the research process.

G. The Value of Fairness in Research

Fairness in research includes fair treatment of all parties involved, such as research participants or research subjects. In the empiricist view, fair treatment of research participants is important to ensure that the data obtained is a true reflection of empirical observations.

The value of fairness in research will refer to the professionalism of researchers based on appropriate criteria and the validity of research data. In addition, it is fair to acknowledge any research source that contributes to the research conducted. The treatment of research objects whether humans or groups of humans or other creatures animals or plants, researchers must treat them fairly and humanely, namely with reasonable respect [12].

H. Stewardship Value in Research

Good stewardship of research resources, including research funds and data, is consistent with the empiricism paradigm, which emphasizes the use of these resources to support observation, testing, and the development of knowledge based on empirical evidence. This value is intended to enable research institutions or affiliates to demonstrate good research management.

The value of stewardship is carried out by researchers to serve the institution, discipline or research institute, for example article review, editing, reviewer of articles outside the institution. Researchers who are more senior or more knowledgeable can become mentors or teachers to supervise new researchers directly or indirectly. This value is also interpreted in the commitment of research institutions in the development of knowledge without specific intentions, but only for the purpose of knowledge, as well as a forum for the wider community to understand or read research results as well as a forum for a researcher himself to obtain publication rights and supervisory functions.

I. Norm Communalism in Researcher

Researchers openly share new findings with fellow researchers [13]. Researchers should produce research that can be widely and effectively used by the general public, therefore research should be based on simplicity, effectiveness, and ease of application. Even if the research is conducted by several researchers, the rights of the creation of the research results should be shared in order to benefit and enable the development of more specific research results in the future.

Concerning the full utilization of research results, researchers should not fabricate data or obscure data so that their research cannot be applied to the field. If honesty is applied according to empirical evidence, some research results can be applied even though they are not fully utilized [23].

J. Norm Universalism in Researcher

Researchers evaluate research based on merit, which is based on universal acceptance in the field. Principles or standards should be widely recognized and accepted in the wider

community. This norm also includes objectivity, honesty, openness and integrity. Researchers must maintain harmonious relationships between researchers, institutions, groups, and communities because the urgency of research is from and for the community.

Researchers must also be able to take responsibility for their research that researchers conduct research in accordance with good quality and ethics. Researchers must provide research results that are acceptable to the general public, starting from data analysis, the use of simple language, and responsible conclusions.

K. Norm of Disinterestedness in Researcher

Researchers conducting research are motivated only by the contribution of knowledge and discovery, not by personal gain or certain interests. Research institutions should act only for scholarship not for personal gain or even power and politics. This value emphasizes the importance of objectivity and neutrality in conducting research. A good researcher should not prioritize money or position orientation in conducting research. If that is the case, then the research is just "research", not a contribution to existing knowledge or a patch-up of other research deficiencies.

L. Norm of Organized Skepticism in Researcher

Researchers take into consideration all new evidence, hypotheses, theories, and innovations, opposing or even contradicting their research. According to research conducted by Ref. [24] professional skepticism must exist in researchers by not taking the results of research for granted but also questioning all information what, when, how, who, why and where, so that research is considered reliable, getting accurate and appropriate data in the field, recognized and accountable.

Organized skepticism can be said to be a critical attitude, not taking things for granted, and hesitating by going through a valid and measurable testing process. In philosophical terms, organized skepticism is how to strengthen the mechanism and copyright of scientific knowledge through a process that requires a basis based on researcher criticism and accurate validation [25].

Skepticism itself is an attitude of doubt and lack of trust, to look around, to consider, or can be understood as an understanding that doubts and distrusts knowledge without first obtaining adequate and accurate explanations [26].

M. Pros and Cons for Researchers

The rapid development of artificial intelligence is inseparable from the pros and cons or advantages and disadvantages in it. One of the main highlights is the violation of the

researcher's code of ethics in conducting research. Violations in research have many types such as plagiarism, findings that do not match the facts, falsification, and fabrication.

1. Advantages for Researchers in Utilizing Artificial Intelligence in Research

The main advantages of utilizing artificial intelligence for researchers are reference management, searching for relevant reference sources, checking plagiarism, and discussing with other researchers. First is reference management, by utilizing artificial intelligence or similar products, researchers can group reference sources, and reference sources that will be read and analyzed by researchers will be stored in the database.

Second, finding relevant reference sources. It is undeniable that one of the ways to increase the productivity of researchers is to find relevant reference sources according to what they are researching. If the manual way of previous researchers was to visit library sources, research institutions, or other researchers to collect relevant references, with the help of artificial intelligence, researchers can easily search effectively for relevant reference sources.

Third is checking the level of plagiarism. Checking the level of plagiarism can be done easily by researchers to see if what they write does not cause repetition of research or excessive citations. This convenience cannot be achieved by previous conventional researchers, so there could be repetition of research topics.

Fourth, discussions with other researchers. The recent Covid-19 pandemic has changed the way discussions are conducted online or remotely. Researchers can now conduct discussions with other researchers by utilizing technology, for example through Zoom and Google Meet. Discussions are carried out for research data collection and research criticism.

2. Drawbacks for Researchers in Utilizing Artificial Intelligence in Research

Utilizing artificial intelligence in research for researchers has its drawbacks, ranging from the critical thinking ability of researchers to fabrication, falsification, and plagiarism of research data. The above weaknesses are only a few of the major weaknesses that occur. Researchers should have researcher integrity to use data, ownership of data access, data storage, and withdrawal [27].

The first is the critical ability of researchers, researchers who predominantly only use artificial intelligence in conducting research tend not to hone their critical thinking skills which will have an impact on the absence of progress in their abilities and even the research produced. In the practice of utilizing artificial intelligence, they can help researchers provide summaries of various researchers without going through the results of reading [28].

The second is fabrication, which is an act of fraud in research carried out by researchers to fabricate data, analysis results, or information presented. [29]. Utilizing artificial intelligence is vulnerable to the process of fabricating data freely and not based on findings in the field. The next drawback is falsification, an act of fraud committed by altering or obscuring research data. Researchers can change research data according to what they want so that their research seems to be useful and classified as good. Changing data is sometimes due to not going directly to the field to find empirical data.

Plagiarism is done by plagiarizing, taking works, writings, opinions, and thoughts and making them as if they were one's own. The use of artificial intelligence will make researchers complacent with what is "instant" and "provided". Plagiarism in artificial intelligence in research is closely related because the data to be shown is existing data, and researchers can just take it without paraphrasing and citing clear sources.

Conclusion

Utilization of artificial intelligence technology in research must be done carefully while still referring to the values and norms of researchers. Artificial intelligence is also researched by researchers in their fields that aim to facilitate human work not to replace human work. Especially in a researcher, researchers can use or utilize artificial intelligence in research but only in the form of secondary assistance, the rest must be done and validated by the researchers themselves and among other researchers. There are six research values, namely objectivity, honesty, openness, justice, responsibility, and stewardship/service, while there are four researcher norms that must be followed by researchers, namely communal, universal, knowledge motivation, and organized skepticism. If all ten values and norms are fulfilled, the results of the research conducted will be in line with the researcher's code of ethics and the results of the research can be accounted for. The use and utilization of artificial intelligence in research will also be very useful if used properly. Novelty, effectiveness, efficiency, and development of research strategies can be done by researchers in the modern era. Accepting artificial intelligence and rejecting the replacement of the research profession.

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Conflict of Interest

The authors declare that there is no conflict of interest.

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