

## Developing Ethical Science Trough Education

Teti Ratnasih<sup>1</sup>, Tedi Priatna<sup>2</sup>, Hariman Surya Siregar<sup>2</sup>, Nurhamzah Nurhamzah<sup>2</sup>

<sup>1</sup>*Department of Early Childhood Islamic Education, UIN Sunan Gunung Djati Bandung, Indonesia*

<sup>2</sup>*Department of Islamic Education, UIN Sunan Gunung Djati Bandung, Indonesia*

### **Abstract**

*Is science value-free? Or is it valuable only for the scientists? Does someone have ethical or moral obligations for the knowledge they have? If education is defined as a process of “teaching” knowledge, what kind of knowledge should be taught? What function does education have in regards to science? Does education have a role in determining the direction and shade of science in the future? By using philosophical critical analysis, this study describes the concept map of ethics in science, the procedure of developing ethical science, and the construction of functions and roles of education in the development of science. Science does not only have pragmatic values, but the process should also follow the applicable ethics. Science, through the actors, must be able to consider the ethical values or aspects of the development of science itself. Scientists, including educators, need not only to share scientific facts and information with the society, but also to explain the use-values, impacts, and expectations carried by science.*

**Keywords:** *Axiology; Ethics; Science; Valuable Education*

### **1. Introduction**

Knowledge is the description of an object, either in individual memories or in written documents. What humans know about an object is called knowledge. Humans gain the knowledge they have with their abilities to feel, to think, and to sense. Thinking is a human being's identity, because by thinking they know themselves and what they see. Humans could also gain knowledge through intuitions and revelations. In fact, for many people, the knowledge coming from intuitions and revelations is often considered more convincing. The concept of knowledge is epistemologically less interesting [1] especially in the social epistemology in which the core dimension is that rationalism is valued more than knowledge [2].

In one of Plato's works, Meno, it is said that Socrates asked why knowledge is more valuable than belief [3]. This question then motivates many thinkers and philosophers to seek an explanation of how knowledge has more practical values in life than a mere belief. A true belief of the way rice should be planted, for example, however, might bring people a good amount and quality of rice yields as well as the knowledge of how to plant rice. Therefore, Plato then proposed his idea that knowledge is created in a specific way, making it different from belief. Knowledge, unlike belief, must be tied down to the truth. This is the only way that knowledge could be better guidelines for humans' actions. Knowledge gives standards to believe, and belief only aims at knowledge [4], [5]. Knowledge develops because humans never stop thinking, and it leads to the changes in civilizations, the ethical civilizations desired by mankind. Someone could put forward a theory of less valuable knowledge if it can explain a phenomenon [6].

In the context of the philosophy of science, this matter belongs to Axiology, which analyzed the ethical and aesthetical values of science, ethical and moral contents of science, as well as the scientists', society's and others' responsibilities resulting from the values. What is studied in axiology is the assessment or decree of values which later focuses on ethical and aesthetical ones. The analysis of ethics will be about the concepts of right and wrong as well as good and bad in both personal and social contexts.

Meanwhile, the analysis of aesthetics will be about the concept of beauty and harmony. Plato's ethics could not be separated from its epistemology of what and how a person gains knowledge [7]. It shows that knowledge could not go without the ethical values it contains. The recent practices of education also call for the ethics which focus not on conformity to fixed morals but the actions [8].

Ethics in this discussion is given more emphasis specifically because of the current development of the modern era and society. It has also become one of the crucial topics to discuss, considering the development of science and technology which makes it possible for humans to do things against morals or ethics. Aristotle argued that "Socrates was the first human who sought universal things in ethics without separating them [7]. It shows that ethics is of great significance. The threat of nuclear war, biological weapons, scarcity of resources, misuses of information and communication technology, and other problems have bad potentials for mankind. Even though scientists do not play a direct role there since it depends strongly on the humans, in the context of axiology of science they could not be ignored.

Knowledge must have values that direct humans to good things to construct their thoughts to understand the world well and be good individuals who could be useful for others. Knowledge becomes "the perfect truth" [9]. Science is the prominent contributor to our understanding of the natural and social worlds; and its involvement with religion, worldview, economy, and technology has a big influence on the culture [10], [11].

This "knowledge as the guidelines for actions" is later discussed by many scientists. It is whether science is value-free or not, whether someone has ethical or moral obligations for the knowledge they have, or whether knowledge is only valuable for them. This paper seeks to explain the concept map of ethics in science, the procedures of developing ethical science, and the construction of functions and roles of education in developing ethical science.

## **2. Research Method**

This study uses a qualitative approach. The approach is used to interpret the data analysis result deeply and comprehensively until qualified recommendations of this study are found [12]–[14]. One of the methods in the qualitative approach is content analysis [15]. It is to describe particular subjects related to the study. The subjects of this kind of study are human ideas or thoughts revealed in the primary or secondary manuscripts [16]. The data collection of this study uses the library as the primary source. The data are analyzed in the following steps: (a) description, (b) discussion, and (c) enrichment and criticism, then (d) analytic studies of the primary ideas through the analysis of relationships, comparisons, and development of rational models [17].

## **3. Result and Discussion**

### **3.1. Ethics in Science**

Experts have long called for how urgent it is to discuss the matter of morals and ethics in science. Max Weber (1864-1920 M) stated that even the most rational basis of science is not free from value judgment [18]. Scientific activities would always be related to humans' conditions and lives. Hence, science, through humans, must be able to consider the ethical values and aspects of the development of science itself. Socratic ethics is marked by two paradoxes, i.e. cautiousness paradox and moral paradox [19]. It becomes the idea that ethics could not be separated from morals. There are specific corridors that need to be preserved to prevent science from violating the norms or ethics applied in society. It is similar to the local culture and traditions which have been inherited for generations and are still consistently preserved and performed [20]. It is because they still hold on to the principles and norms without violating it. Take biomanipulation as an

example. Despite principally intended as a development of science, it could not be applied to things that could violate the existing norms.

However, some other thinkers might call for the opposite thing. Science exists for the sake of science itself, and not for other things. Science does not have any categories of morals or ethics and has nothing to do with good or bad. What is important is the objectivity and obedience to the scientific procedures to obtain correct formulas. If then some people misuse the result of a scientific study, science does not responsible for any of it. Being wise or being reckless in using scientific knowledge makes it possible for a person to have a responsibility in society as the primary decision-maker [21]. For example, science gives information on how to make a weapon, but it does not have any moral responsibility for its mass production or its misuse for the crime. It is a human being who is responsible for it.

According to a practically universal consensus, the fundamental purpose of a human's act is their personal contentment [18]. The contentment here might be defined as not violating other people's rights such as justice and safety. It becomes the foundation that although science is created by people's interest, the implementation must be carried out ethically.

Such arguments could be found in many debates and discussions of ethics in science. Nonetheless, what do ethics mean? Ethics and the values simply could not be separated from morals. Both terms are often used interchangeably for their etymology. 'Moral' derives from the Latin *Mos* (plural: *Mores*) which means habit. It has the same meaning as *Ethos* which means custom. When the word 'moral' is used, it refers to the rules made by the people to define what is right and wrong, or good and bad. On the other hand, 'ethic' refers to the theories regarding morals, the theories of system and rules. In other words, moral or morality deals with reality or human life, and ethics is the academic formulation resulted from the analysis of morals.

In many studies of morals or ethics, there are at least four principles that need to be recognized. They are:

*a. The Principle of Non-maleficence*

This principle means that someone could not do anything that has potential danger or loss on others. Someone who commits a crime, such as hitting, injuring, or harming others shows action against the moral principle. This principle applies anywhere because there is no regulation anywhere that allows someone to harm or put anyone in danger without any consequences.

*b. The Principle of Beneficence*

This principle means that someone's action must bring good to him and other people. In other words, everyone is obliged to include kindness in everything they do. Simply put, an action someone takes must have positive values by not harming others.

*c. The Principle of Autonomy*

This principle means that everyone must respect and appreciate others' autonomy, especially the decisions and choices someone makes in their life. In this case, we have to realize that everyone has their own right to control themselves, and we could not interfere with them as long as they do not break the rules or violate other people's rights. However, someone's autonomy in taking an action should also have limits if it puts someone else or even himself in danger.

*d. The Principle of Justice*

This principle means that we have to treat similar cases the same way, specifically by holding onto the values of equality, necessity, contribution, and the effort made. Equality

means that all the carried advantages and burdens need to be distributed equally. Necessity means that someone with more needs is supposed to get more advantages. Contribution means that everyone must bring good as well as they could. Effort means that everyone must get the advantages or profit in accordance with the efforts they make.

These four principles become the bases in formulating moral standards. The understanding of these basic principles is vital considering the different moral standards applying in society depending on the cultures, traditions, customs, norms, beliefs, and laws. Every individual is responsible for taking care of themselves through applied morals or ethics. The values of responsibility include not only self-obligation and accountability but also the individual's self-discipline which enables them to avoid conflicts and to realize the harmonious social system [22]. These principles also become the basic considerations of ethics. In brief, an act is considered ethical as long as it does not cause bad effects or harm anyone, does not violate anyone's rights and boundaries, is able to bring good to the actor and others, and is based on justice.

The same pattern also applies when the principles are put in the frame of science. Scientific activities (such as scientific experiments) are not supposed to harm any living things, are not supposed to create any products that could destroy life, must have value in use on life, and many others. Yet, each point might raise different opinions and discourses. There might be a lot of debates on it, especially when the moral standards are arbitrary, coercive, rigid, and do not give space for individuals to express their ideas or to conduct any scientific activities because it deals with taboo or forbidden things in the society. Anthropology is suggested to realize its own moral agenda and figure out the epistemological impacts on the scientific representation that we need to obtain [23].

The discussions of morality and moral standards, or about ethics and various things related to them, as well as an individual's self-values, would finally put someone in relation to someone else. If there was only one person on earth, the principle of autonomy or freedom would be the only principle applies, while the other principles such as justice and equality, people's interest, and the compulsion not to harm others would automatically be not applicable. Thus, when talking about morals or ethics, someone must be seen as an individual among others individuals who have rights, obligations, needs, wants, efforts to achieve goals, beliefs, and complex mindsets. This is important because humans as social creatures could not live alone and need others to be able to fulfill their needs, so the good morals and ethics need to be developed through education. Moral education is to create an environment suitable for interiorizing the components of social morality into students' personality structure, which later leads to the implementation of the appropriate moral attitudes [24].

Furthermore, there are two principal views in the study of morals; they are absolutism and relativism. Relativism defines morality as something subjective and cultural-historically dependent, while absolutism describes morality as something objective and universal [25]. Absolutism is a concept in ethics which assumes that there are moral commands and prohibitions which are believed as true and applicable beyond time and space. The believers of this concept argue that there is one moral code that could be applied to everyone, derived from shared needs and objective reasoning. Many things are considered right or wrong from an objective point of view, and not merely from a subjective point of view. Someone evaluates someone else's moral attitudes based not only on what they do but also on what makes them do it [26]. In this absolute ethic, whether something is right or wrong would never change. It is not affected by any changing situation or underlying reasons. Committing child abuse, for instance, is a wrong action regardless of where a person lives and what situation they are in. An immoral act is intrinsically not right, which means that there is something wrong with the doer. Something is not right because of the situation or the underlying reasons. It is wrong because it is against morals.

On the contrary, ethical relativism is a concept that ethics and moral order applies relatively, depending on the context of the society who believes in it. Ethical relativism is

driven by an acknowledgment of diverse histories, cultures, individual conditions in different social situations. This viewpoint out that people might not always agree on what is good and what is bad as well as what is right and what is wrong. One might argue that abortion is a wrong action and could not be justified whatsoever. However, there are also some people who believe that an abortion could be done and accepted as an action that does not violate morality as long as there is a strong reason behind it. Different cultures, beliefs, and views of life might express different points of view in terms of the moral order of what is good or bad and what is right or wrong to do.

The polemics of these two ethical views, as well as the debates of ethical values of knowledge, is still going on until today. Each group, either the one who supports or refuses it would always have arguments to counter the other. This condition makes it difficult to claim whether, for example, the ethical values of knowledge is absolute or relative. The basic ethical principle is something every thinker always aspires, but the universal and non-contradictive one could never be achieved [27]. For those who do not believe that ethical values of science exist and that scientists have moral responsibilities on what they do, it would not be a problem. For them, scientists need only to work well for the sake of the science itself. Meanwhile, those who support the ethics in science and the importance of scientists' moral responsibility would proclaim that the existence of these norms is reasonable, considering that scientific activities could not be separated from the life humans live. Even when a scientist involves in a specific activity, there are some ethical principles they need to follow, the one that is applied as the code of conduct of their profession. Nonetheless, scientific attitudes are generally in line with ethical attitudes. Scientists are not allowed to lie or cover the truth, not allowed to hide the facts and evidence they find, not allowed to conceal the impacts of their activities, and some other ethics. The understanding of what might be assumed as immoral acts or moral loss could be effectively used by some people to fight for racism [28]. It is because they have good commitment and moral control.

### **3.2. Science and Purposeful Education**

The complex current development of the modern era and the society, which mainly caused by the development of science and the new discoveries specifically of technology, basically shows how science does not exist only in the ivory tower or laboratories. Science is always connected to the policies made by certain parties, which would in turn touch and come back to society. Accordingly, making a distinction or separating science from society is not desired by the people themselves. Science could only test itself in the practical application of theories and research findings in real life. If science could not improve the quality of life, it would have long been forgotten.

It is worth it to learn from the long history of philosophy. It was the intellectual alternative to understand the world, at first. As time goes by, many branches of science dissociate themselves from philosophy, and people no longer pay attention to it and are even unfamiliar with the studies. People would generally respect science when it has practical uses in their life. How do we understand the practical use of, for example, metaphysics as the main study of philosophy? Philosophers could surely explain it but the explanations mostly fail in making people aware of how important it is. It is different from the sciences which come from reality since the beginning and are back to society in the forms of specific outcomes that people could actually use. This is actually the virtue of science.

Also, this condition makes people eventually believe that science could not be detached from a human's life. As the two are inseparable, science does not only have pragmatic values but in the practice should also be in accordance with the applicable ethical values. Science should develop not only to help humans have an accurate and holistic understanding of the world but also to give foundation and norms of life to be able to live ethically together. The scientists, including teachers and educators, need not only to give information and scientific facts to the society, but also to explain the use-

values, impacts, and expectations of the science. These values are urgent to teach the students, helping them live well in society. Education is supposed to develop morals or ethics by modeling the values. A leader of an organization needs to perform good ethics to set an example. Power increases the tendency to discuss moral issues, increase the tendency to integrate feelings and cognitions, and increase obedience to principles and rules [29].

This kind of idea could later be seen in, for example, the management of education and/or the composition of the curriculum in schools or other formal educational institutions. Character or moral education, which is already contained in religious education and other subjects, is not only the responsibility of the school, but also of the family and broader social environment. Science is never value free. It should be taught and developed in the learning process to reach specific purposes, either the scientific academic, ethical, religious, or pragmatic purposes. Take biology as an example. It needs not only to deliver the materials about biology, but also to build the students' characters and instill the ethical values in accordance with the characteristics of biology learning. Consequently, in a biology class the teacher is required to encourage students' scientific thinking ability as the compliance of the scientific character of biology. It needs also to foster ecological awareness to protect the environment and to maintain a good relation between humans and the nature. Those are the indicators of ethical values of biology in educational context. The same principles apply in other subjects such as math, physics, social sciences, as well as art and culture.

However, integrating ethical values into the learning of natural science or other subjects is not an easy thing to do. A clear basic curriculum, the teacher's competence, good facilities, and other supports are needed. This effort is essential to do in order for the science to be familiar for the students and to have use-values in their life. Therefore, all the stakeholders and authorities need not only to design purposeful education management, but also to ensure that the existing formal educational institutions could take part in the mission of socializing knowledge to and instilling its ethical values in the students. The instillation of ethics or moral must be carried out through models or examples from the early age to make sure that they would have good habits. The failure of character education from the early age might cause a person have bad personality in the future.

Purposeful education in this case means the organization of education and learning which is based on ethical interests to fulfill other educational purposes, whether they are formal, material, or pragmatic. Education ensures that science could be used in accordance with the moral normative frame, without hindering the development of science itself. Purposeful education could also be seen as an effort to conduct an accessible education for everyone regardless of the sociocultural, religious, or racial backgrounds. So, knowledge as a human's natural right could be fairly gained. Education plays a role in building citizen's good character and it is undeniable. The civic and ethical education nowadays is more progressive than the one given long time ago, the one that has introduced the youths to democracy and human rights like never before [30]. The education in action surely delivers the messages of kindness, justice, and other good things.

The equal opportunity to gain knowledge becomes its real ethical value. Everyone, and not just a few, not just the scientists or the haves, deserves to gain knowledge. Education must be opened as widely as possible and is supposed to make space for the society's contribution and participation in the development. It is only by doing so that the society might involve in as well as get the advantages of science. What needs to be emphasized here is that the people's contribution and participation are not to hinder the development of knowledge or any scientific activities by ethical or moral reasons. Instead, it is the positive contribution primarily to formulate ethical decisions regarding the outcomes of the knowledge, or their involvement in the implementation of the product extensively.

### 3.3. Developing the Civilization of Knowledge through Education

The twenty-first century, as pointed out by Peter Drucker is the century of knowledge. In this century, the primary resource of the economy is knowledge [31]. A person's modality lies in his ability to learn and process the learning outcomes into innovative ideas useful for life. Also in this century of knowledge, science workers would be in the main class in the society. Those who do not have access to learning or decent education would find it difficult to thrive and become a part of the excellent and competitive generation. Someone's productivity would be determined by their knowledge and learning abilities.

Virtually, knowledge and science have long been able to make someone excellent and help them get a good status in society. In the nineteenth century, as Drucker described it, the excellent ones were those who had the ability to apply knowledge into devices, processes, and products. In the twentieth century, the excellent ones were those who had the ability to apply knowledge in their jobs. Meanwhile, in the twenty-first century, or nowadays, the excellent ones are those who have the ability to apply knowledge in the knowledge itself.

What Drucker meant by the ability to apply knowledge in the knowledge itself is explained as follow:

Knowledge is now being applied to systematically and purposefully define what new knowledge is needed, whether it is feasible, and what has to be done to make knowledge effective. It is being applied, in other words, to systematic innovation. As a result, knowledge has become a resource rather than a resource. This fact changes – fundamentally – the structure of society. It creates new social, economic and political dynamics.

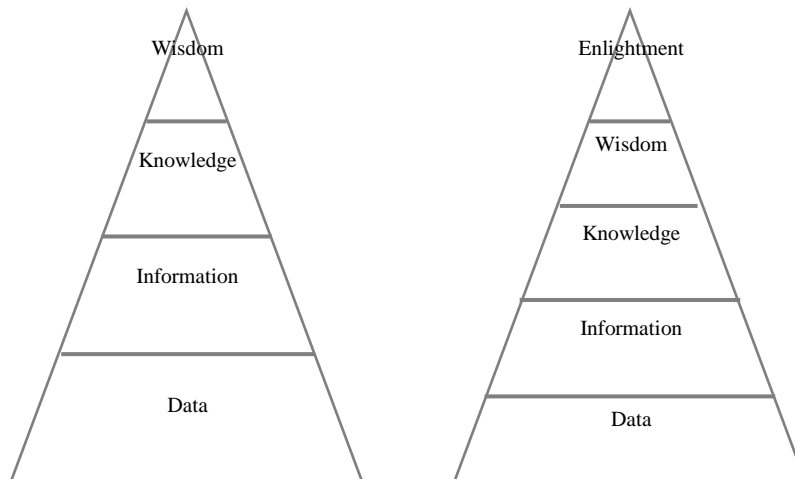
According to Drucker, those who are going to be the winners of the competitions in life are the ones who have and master the knowledge of knowledge [32]. They are not only educated and knowledgeable, but also able to develop the knowledge into new knowledge in the future. Every sector in life would be an arena of competition, including the educational institutions. Schools, universities, libraries, academies, and cram schools become an important place to prepare students to be ready to compete. A person's assets are no longer their ownerships of lands, properties, machines, or wealth, but their ability to change other's mindsets, their ability to make an investment, their ability to have innovative and creative ideas, and their ability to develop the values of knowledge. It shows how important it is to develop human's spirituality, and to switch the purpose of development from the materialistic to the non-materialistic ones [33].

The ability to manage knowledge, eventually, becomes the main thing a person needs to have in order to survive and win the competition of life, as the tool to help utilizing resources in smarter and more efficient ways to reach higher business goals more productively [34]. Educational institutions, in this case, need to be involved and participate actively to reach the goals. When everyone is able to realize the importance of knowledge for their life, we could all take part in developing the civilization of knowledge. However, the ability to manage knowledge is obviously not easy to have. In the general concept of knowledge management, the ability to manage knowledge as one of the essential concepts is the ability to convert from the tacit to the explicit knowledge. Tacit knowledge is the individual knowledge that exists and is integrated with experiences and other intangible factors such as individual beliefs, perspectives, and values held. On the other hand, explicit knowledge is the documented tacit knowledge. Explicit knowledge is the knowledge that has been articulated in a formal language and could be easily transferred to other people through education and learning.

From these two different types of knowledge, an individual or organization is eventually required to access and manage the tacit knowledge owned by others or by organization members. The new shared knowledge could then be accessed, shared, and

spread for the common good. Thus, how to transform the tacit into the explicit knowledge is basically an important task and part of the knowledge management. While the classical knowledge pyramid put wisdom on top, the pyramid introduced by the knowledge management has another level above wisdom; that is enlightenment. It is the level in which knowledge becomes the shared resource which is distributed evenly in a community, so that they could reach the goal and virtue together.

Knowledge could be more organized by making the system of knowledge management and a clear procedure of the processes. The collection of tacit and explicit knowledge could be conducted by introducing new information or knowledge to a forum and discussing it in more details if it is desired to be actually put in the system [22]. Building knowledge is an effort to change education fundamentally, to make it a coherent way to initiate someone into the culture of knowledge creation [35]. Knowledge always gives good influences to someone's mind power. Education does not merely change a person from being ignorant to being knowledgeable. Even better, it is a continuous process of guiding someone to realize that they are part of one another. A mindset change of the nature of education is an absolute prerequisite of the attempt to present quality education in society [36]. The planning, the process, and the result must focus on the purposes and nature of education to develop civilization.



**Figure 1.** Differences of Knowledge Pyramids [34]

The effort to make knowledge, which is originally scattered in many individuals, a shared intellectual asset is our main task. It is essential because generally, every individual has different abilities and intelligence. Some people are more competent than others. Meanwhile, society could only develop well if all the members have the expected ability in carrying out their tasks and functions. In the context of educational institutions, the goals of education could only be reached well when all the elements have equally good skills.

Moreover, there are principally three basic processes in the knowledge management as follows:

- a. Knowledge acquisition; that is a process of acquiring or developing intellectual assets, including personal understanding, expertise, experiences, and inter-data relation. In this process, there is a data recording and storage in the database of a knowledge repository.
- b. Sharing knowledge; that is the process of spreading and making the knowledge available for everyone who needs it in the user organization. The sharing process is



carried out through the social process in the organizational culture that respects sharing knowledge. The process might occur either traditionally through discussion and colloquium or through technology-based modern medium.

- c. Utilizing knowledge; that is the process of using the knowledge in the organization. It includes the implementation of knowledge in the making of work instructions according to the past experiences and knowledge. In this process, the activities of developing and improving the collected knowledge are carried out.

The above three process in practice would form a cycle of sustainable activities. Nevertheless, more completely according to Bukowitz and Williams, the cycle of knowledge management also goes through stages including [37]: (1) Get or the process of searching the information needed to make decisions, solve problems, or to innovate; (2) Use or how to utilize the information to innovate (either individually or in groups); (3) Learn or how someone could learn from their experiences, either the success (best practice) or the failure (lesson learned) to create competitive advantages; (4) Contribute or giving knowledge gained from learning to other individuals; (5) Assess or evaluating the individual and what they have regarding the knowledge; (6) Build/sustain or convincing that someone's intellectual assets in the future would help him survive and excel in the competition; and (7) Divest or removing the unused (worthless) knowledge.

The knowledge management is crucial to get as well as to conserve the best ways and values someone might obtain and share to the people. Without knowledge management as one of the most valuable assets for life, there would be neither innovation nor achievement of specific values that could become the guidelines of living and growing together.

#### 4. Conclusion

Knowledge since the very beginning, in many contexts of education, has never been value-free. It is taught and developed in the learning process to reach certain goals, either the scientific academic, the ethical, the religious, or the pragmatic one. Building ethical knowledge through the improvement of roles and qualities of educational institutions could not, eventually, be separated from the effort and ability to manage knowledge effectively and evenly. Building ethical knowledge through education means to make the educational institutions able not only to take part in the spread of knowledge, but also to create their own knowledge, spread and utilizing it to build a better life together in the future. By doing so, knowledge might give out its highest values for itself and for life.

#### Acknowledgement

Researcher would like to thank to the Research Center and Library Service Unit of UIN Sunan Gunung Djati Bandung for their research assistance and publication assistance.

#### References

- [1] H. Kornblith, "Why Should We Care About the Concept of Knowledge?," *Episteme*, vol. 8, no. 1, pp. 38–52, 2011.
- [2] A. I. Goldman, "Group knowledge versus group rationality: Two approaches to social epistemology," *Episteme*, vol. 1, no. 1, pp. 11–22, 2004.
- [3] M. Fricker, "The value of knowledge and the test of time," *R. Inst. Philos. Suppl.*, vol. 64, pp. 121–138, 2009.
- [4] D. Whiting, "Norms and Aims of Belief," *aim belief*, p. 184, 2013.
- [5] R. Rubira-Garcia, B. Puebla-Martinez, and R. Gelado-Marcos, "Social representations in studying information, knowledge, and mediations: A critical review," *Soc. Sci.*, vol. 7, no. 12, p. 256, 2018.
- [6] D. Pritchard, "Knowledge, understanding and epistemic value," *R. Inst. Philos.*

- Suppl.*, vol. 64, pp. 19–43, 2009.
- [7] A. Silverman, “Plato’s middle period metaphysics and epistemology,” 2003.
- [8] A. Bates, “Readiness for School, Time and Ethics in Educational Practice,” *Stud. Philos. Educ.*, vol. 38, no. 4, pp. 411–426, 2019.
- [9] J. T. Edwards, “The Perfectly True Knowledge,” 2009.
- [10] M. R. Matthews, *Science teaching: The contribution of history and philosophy of science*. Routledge, 2014.
- [11] N. Mohamed, “Islamic Education, Eco-ethics and Community,” *Stud. Philos. Educ.*, vol. 33, no. 3, pp. 315–328, 2014.
- [12] Sharan B. Merriam, *Qualitative Research: A Guide to Design and Implementation*. 2009.
- [13] J. A. Maxwell and L. E. Reybold, “Qualitative Research,” in *International Encyclopedia of the Social & Behavioral Sciences: Second Edition*, 2015.
- [14] J. A. Maxwell, “Designing a qualitative study. The SAGE handbook of applied social research methods,” *Appl. Soc. Res. Methods*, 2008.
- [15] Y. M. Luna and T. M. Montoya, “‘I Need this Chance to Help My Family’: A Qualitative Analysis of the Aspirations of DACA Applicants,” *Soc. Sci.*, vol. 8, no. 9, p. 265, 2019.
- [16] M. Tavallaee and M. Abu Talib, “A General Perspective on Role of Theory in Qualitative Research,” *Spring*, 2010.
- [17] J. S. Suriasumantri, *Penelitian Ilmiah, Kefilsafatan, dan Keagamaan: Mencari Paradigma Kebersamaan. Dalam M. Deden Ridwan, Tradisi Baru Penelitian Agama Islam: Tinjauan Antar Disiplin Ilmu*. Bandung: Nuansa, 2001.
- [18] G. Del Re, “Ethics and science,” *HYLE-International J. Philos. Chem.*, vol. 7, no. 2, pp. 86–102, 2001.
- [19] H. H. Benson, *Socratic wisdom: the model of knowledge in Plato’s early dialogues*. Oxford University Press on Demand, 2000.
- [20] N. Nurhamzah, T. Priatna, A. Hasanah, and P. Z. Muntaha, “Inheritance model-based character values of local wisdom,” in *International Conference on Islamic Education (ICIE 2018)*, 2018.
- [21] G. S. Aikenhead, “Collective decision making in the social context of science,” *Sci. Educ.*, vol. 69, no. 4, pp. 453–475, 1985.
- [22] B. P. Tan, N. B. M. Naidu, and Z. Jamil, “Moral values and good citizens in a multi-ethnic society: A content analysis of moral education textbooks in Malaysia,” *J. Soc. Stud. Res.*, vol. 42, no. 2, pp. 119–134, 2018.
- [23] W. Stoczkowski, “The fourth aim of anthropology: Between knowledge and ethics,” *Anthropol. Theory*, vol. 8, no. 4, pp. 345–356, 2008.
- [24] A. D. Manea, “Influences of religious education on the formation moral consciousness of students,” *Procedia-Social Behav. Sci.*, vol. 149, pp. 518–523, 2014.
- [25] T. S. Rai and K. J. Holyoak, “Exposure to moral relativism compromises moral behavior,” *J. Exp. Soc. Psychol.*, vol. 49, no. 6, pp. 995–1001, 2013.
- [26] C. R. Critcher, E. G. Helzer, and D. Tannenbaum, “Moral character evaluation: Testing another’s moral-cognitive machinery,” *J. Exp. Soc. Psychol.*, vol. 87, p. 103906, 2020.
- [27] F. F. Purnama, “Mengurai Polemik Abadi Absolutisme dan Relativisme Etika,” *Living Islam J. Islam. Discourses*, vol. 1, no. 2, pp. 273–298, 2018.
- [28] H. Szekeres, E. Halperin, A. Kende, and T. Saguy, “The effect of moral loss and gain mindset on confronting racism,” *J. Exp. Soc. Psychol.*, vol. 84, p. 103833, 2019.
- [29] A. Fleischmann, J. Lammers, P. Conway, and A. D. Galinsky, “Paradoxical effects of power on moral thinking: why power both increases and decreases deontological and utilitarian moral decisions,” *Soc. Psychol. Personal. Sci.*, vol. 10, no. 1, pp. 110–120, 2019.

- [30] E. Bayeh, “Role of civics and ethical education for the development of democratic governance in Ethiopia: Achievements and challenges,” *Pacific Sci. Rev. B Humanit. Soc. Sci.*, vol. 2, no. 1, pp. 31–36, 2016.
- [31] P. F. Drucker, “Knowledge-worker productivity: The biggest challenge,” *Calif. Manage. Rev.*, vol. 41, no. 2, pp. 79–94, 1999.
- [32] P. F. Drucker, “The rise of the knowledge society,” *Wilson Q.*, vol. 17, no. 2, pp. 52–72, 1993.
- [33] A. Skowronski, “A civilization based on sustainable development: its limits and prospects,” *Sustain. Dev.*, vol. 16, no. 2, pp. 117–125, 2008.
- [34] A. Anand and M. D. Singh, “Understanding knowledge management,” *Int. J. Eng. Sci. Technol.*, vol. 3, no. 2, pp. 926–939, 2011.
- [35] M. Scardamalia and C. Bereiter, *Knowledge building: Theory, pedagogy, and technology*. na, 2006.
- [36] D. Kodrat, “Urgensi Perubahan Pola Pikir Dalam Membangun Pendidikan Bermutu,” *J. Kaji. Perad. Islam*, vol. 2, no. 1, pp. 1–6, 2019.
- [37] W. R. Bukowitz and R. L. Williams, “Looking Through the Knowledge Glass,” *CIO-FRAMINGHAM MA-*, vol. 13, pp. 76–85, 1999.