ANSWERING THE CLIMATE CRISIS BY REDESIGNING SCIENTIFIC BUILDINGS BASED ON THE UNIFICATION OF EPISTEMOLOGY AND AXIOLOGY (A Study of al-Farabi's Philosophy)

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Abstract

Abstract This article explores ideas for addressing the climate crisis by redesigning the structure of knowledge based on the integration of epistemology and axiology from the philosophical perspective of Al-Farabi. This article aims to address gaps in studies regarding the reconstruction of scientific knowledge in the context of confronting the climate crisis from an Islamic philosophical perspective. To date, no research has specifically examined how Al-Farabi's philosophy contributes to the construction of knowledge grounded in the integration of epistemology and axiology. This article is the result of qualitative research on Al-Farabi's works as well as other works from journal articles, conference proceedings, books, and online literature discussing the issues of knowledge reconstruction and the climate crisis. Al-Farabi's views were examined using a descriptive-analytical method with a hermeneutic approach. The research findings indicate that Al-Farabi's philosophy addresses the issue of unifying epistemology and axiology through the concept of the active intellect (al-aql al-fa'al). Furthermore, Al-Farabi recommends that the study of knowledge be comprehensive, ranging from partial knowledge (juziyat) to universal knowledge (kyulliyat). This recommendation is intended to ensure that the knowledge acquired is holistic rather than merely theoretical. Such holistic knowledge will guide attitudes in practice so that the effects of science do not harm the environment but, on the contrary, help to protect and preserve it. Moreover, Al-Farabi also posits that ethics must be integrated into science. This fusion of holistic knowledge and ethics reflects the unification of the epistemology and axiology of knowledge. This study contributes to the fields of Islamic philosophy, interdisciplinary studies, and contemporary scientific and ecological research..

Keywords:*epistemology; axiology; integration; environment; active intellect.*

INTRODUCTION

Climate change is a global issue that has been extensively studied across various academic disciplines. These studies have emerged in response to the recognition of climate change as a new challenge that impacts various sectors, such as ecological conditions, social life, and cultural systems (Abbas et.al, 2022), and the knowledge architecture (Stupar et al., 2017). In this study, researchers are working to find a scientific explanation for how climate change occurs, what its impacts are, and how

to identify new breakthroughs to address this issue?

Studies focused on finding scientific explanations for climate change have been conducted by, among others, (*Previdi*, 2021), Ravetz (2000), Sugi and Yoshimura (2004), Gabric (2023), Guo et al., (2023). These studies explain that climate change is generally caused by various human activities, such as the use of fossil fuels, deforestation, the intensification of the greenhouse effect, and other activities that run counter to the principles of ecological conservation. The patterns of environmental damage caused by these activities vary considerably. These include global warming, a reduction in reflective clouds due to changing wind patterns caused by the Earth absorbing more solar heat, a decrease in tropical rainfall, and others. In addition to impacting ecological structures, climate change also affects social life (Iskandar et.al: 2024). This study employs a bibliometric analysis of 112 documents from the Scopus database regarding the impact of climate change on poverty, livelihoods, women, and developing countries. Another article was also written by Soz et al. (2024). In this article, which integrates meteorological data and socioeconomic surveys, the authors present evidence that relatively extreme climate change has affected agricultural practices and the social well-being of farming communities in Bihar, India..

The impact of climate change on cultural systems has also drawn significant attention from many researchers. Among them is Orr (2021), who analyzed 165 research papers published between 2016 and 2020. In his study, Orr found that climate change affects culture, such as through the loss of certain values or the emergence of new values in community life. Another article addressing a similar issue is by Aboulnaga (2024). While Orr previously examined the influence of climate change on community culture, this article highlights the importance of involving local culture in climate change mitigation. Local culture must be integrated with advanced technology to address climate change, ranging from understanding to adapting to these new changes. Slightly different from Aboulnaga, Frlan: 2024 emphasizes the importance of political policies in addressing the impact of climate change on culture.

This article aims to address a gap in the literature regarding Al-Farabi's views on the reconstruction of knowledge—specifically, the integration of the epistemology and axiology of science—as a means of addressing the climate crisis currently facing the world. To date, no study has specifically examined this concept of reconstruction, let alone in relation to climate issues. This aspect has been overlooked by scholars. Three questions are posed to explore Al-Farabi's views. First, how does Al-Farabi conceptualize and elaborate on the idea of unifying the epistemology and axiology of science? Second, how can this idea be translated into an educational context so that it can be applied? Third, how can the idea of unifying the epistemology and axiology of knowledge be used to address the issue of the climate crisis? These three questions will guide the discussion in this article.

METHOD

This article is the result of qualitative research in the field of philosophy. Al-Farabi's views on the unification of epistemology and axiology were chosen as the subject of this study because they possess a sufficiently robust conceptual structure

and line of argumentation. Among Islamic thinkers, Al-Farabi remains one of the primary references in discussions regarding the construction of knowledge. The title "al-Mu'allim al-Tsani" bestowed upon him is a form of recognition of Al-Farabi's expertise, second only to Aristotle as "al-Mu'allim al-Awwal." In this study, the author aims to demonstrate that Al-Farabi's concept of the unification of epistemology and axiology is reliable in addressing the climate crisis currently facing the world..

This article uses the works of Al-Farabi as primary sources, particularly those sections that address the topics of reason, knowledge, the soul, and ethics. Other sections are also examined to the extent that they are relevant to this topic. Primary data sources include Al-Farabi's compiled works, particularly *Risalat fi al-'Aql*, *Maratib al-'Ulum*, *al-Falsafat al-Thabi'iyyat wa al-Ilahiyyat 'inda al-Farabi*, *Kitab al-Huruf*, *Ara al -Ahl al-Madinah al-Fadhilah, *Ihsa al-'Ulum*, *Kitab al-Jam'i Bayn al-Hikmayn*, and several others. Secondary data sources, such as journal articles, conference proceedings, books, and online literature, were utilized to reinforce the primary data and to provide interpretive material regarding the core perspectives of both. The use of these various data sources was intended to achieve a comprehensive understanding of the concept of the unification of the epistemology and axiology of science in the context of addressing the climate crisis.

The data collection process was conducted through an inventory and documentation of Al-Farabi's views on the unification of epistemology and axiology. The data collected was then reduced, classified, and presented based on the conceptual variables of the unification of epistemology and axiology in science. Subsequently, the data was compared using a comparative-conceptual method and analyzed to reveal the conceptual structure and the most prominent characteristics of Al-Farabi's views regarding the unification of epistemology and axiology in the science of knowledge. The analysis phase was conducted using a hermeneutic approach, which allowed for a deeper exploration of the meaning and interpretation of Al-Farabi's views. The analysis yielded an understanding of the integration of epistemology and axiology of knowledge within the concept of the active intellect (al-aql al-Fa'al), the orientation toward happiness, the structure of particular and universal sciences, and the construction of ethics. Furthermore, the analysis is directed toward the reconstruction of knowledge to address the issue of the climate crisis, the practical applications of which include a paradigm shift, the reconstruction of curriculum models, and the internalization of ethical values in learning.

FINDINGS AND DISCUSSION

The Paradigm Shift in Science

Al-Farabi is one of many Muslim thinkers who wrote extensively on the construction of knowledge from a philosophical perspective. His views on the construction of knowledge were heavily influenced by Plato and Aristotle. According to the researchers' findings, Al-Farabi's ideas regarding the construction of knowledge are interconnected and integrated with one another. Al-Farabi's epistemology is closely linked to both metaphysics and axiology. This finding aligns with what Mahdi (2002) outlined: for Al-Farabi, true knowledge does not rely solely on pure rationality but must be directed toward moral ends and universal happiness. Although Al-Farabi does not explicitly articulate this concept of integration, it can

be implicitly inferred from several of his explanations.. This is particularly evident when Al-Farabi writes about the concept of the state (al-maḍinah al-Fadilah). There are at least two points in this book that support the conclusion that this integration of epistemology and axiology was conceived by Al-Farabi. First, when Al-Farabi discusses the essence of the state's purpose, namely how the state must be capable of bringing about justice and collective happiness. However, before getting to this discussion of the purpose of the state, Al-Farabi first elaborates on important topics. These include "the first being," the structure and hierarchy of "being," humanity, social life, and finally, happiness and justice. The discussions on these topics strongly indicate that they are all interconnected. According to Majidi, an ideal state is oriented toward public happiness. Public happiness, in turn, can be achieved through the role of reason in bridging religious and state values. This conception of an ideal state with happiness as its primary goal has been widely criticized by several researchers, such as in the research conducted by Kusnadiningrat (2001), Yasin (2013), Jamil (2016), and Burhanuddin (2018). According to most of these researchers, the concept of an ideal state is impossible to realize (Jamil), serves more as a tool to reject a dogmatic state (Burhanuddin), and is elitist and fails to provide a tangible transformative path, such as the caliphate (Kusnadiningrat). Although these criticisms are based on strong data, there is one thing these researchers have overlooked. Namely, they fail to consider that Al-Farabi was born within a specific spatial and temporal context. According to Majidi, an ideal state is oriented toward public happiness. Public happiness, in turn, can be achieved through the role of reason in bridging religious and state values. This conception of an ideal state with happiness as its primary goal has been widely criticized by several researchers, such as in the research conducted by Kusnadiningrat (2001), Yasin (2013), Jamil (2016), and Burhanuddin (2018). According to most of these researchers, the concept of an ideal state is impossible to realize (Jamil), serves more as a tool to reject a dogmatic state (Burhanuddin), and is elitist and fails to provide a tangible transformative path, such as the caliphate (Kusnadiningrat). Although these criticisms are based on strong data, there is one thing these researchers have overlooked. Namely, they fail to consider that Al-Farabi was born within a specific spatial and temporal context.

Second, when Al-Farabi explains that a leader of a state must possess al-'aql al-mustafad, or perfect reason. It is called perfect reason because the position of al-'aql al-mustafad, as mentioned in [1], is above potential reason (al-'aql bi al-quwwah), actual reason (al-'aql bi al-fi'l), and active reason (al-'aql al-fa'al). In various works written by Al-Farabi, this is explained as in the book [2], al-tanbih 'al sabil al-sa'adah, and according *Ara ahl al-Madinah al-Fadilah, al-'aql al-mustafad* the acquired intellect is a form of intellectual capacity possessed only by those at the level of philosophers. It combines potential intellect and actual intellect. If al-'aql al-mustafad is a prerequisite for a leader in an ideal state, then it can be concluded that the practice of an ideal state must be built upon the leader's capacity to comprehend both epistemology and axiology simultaneously. This conclusion is drawn by considering the text, context, and purpose of Al-Farabi in presenting his ideas. An analytical model interpreting these symbols and objectives has also been employed by other researchers, such as Birdisli (2019), Zeraoui and Uresti (2021), and Shomali (2022), in their studies of Al-Farabi's concept of the ideal state.

How these findings relate to the climate crisis can be explained by the fact that the state has control over many aspects of climate management. The state, as the saying goes, has the power to formulate policies in response to climate change. Regarding policy, in addition to enacting specific regulations to prevent further damage or regulations aimed at repairing environmental damage, the state can also intervene through education. For example, by shifting the paradigm of knowledge and curriculum to align with the vision of addressing the climate crisis. Educators, according to the report, have significant scope to raise awareness about addressing this ongoing crisis.

A paradigm shift in science plays a significant role in addressing the climate crisis. This paradigm shift is necessary because of the wide gap between data and literature and the reality of climate change. A new, interdisciplinary approach is needed. This shift recognizes that a single discipline is insufficient to understand climate change and implement comprehensive mitigation efforts across all sectors of society.

Since its introduction by Thomas Kuhn, the theory of knowledge paradigms has provided a space for understanding that the construction of knowledge is closely related to the reality experienced by humans. [1]. Changing old empirical conditions will give rise to a knowledge crisis, as existing knowledge is formed in response to these conditions. Therefore, changes in the construction of knowledge are needed to adapt to new conditions. If old conditions change while knowledge remains unchanged, an anomaly and a crisis will occur. This is what many countries are currently experiencing [2].

So, what paradigm must be changed now? Before addressing the technical structure of knowledge, a philosophical paradigm must first be established. The philosophy of knowledge must be designed to create a new scientific construct that encompasses climate crisis awareness and mitigation. The reason the philosophy of knowledge must be changed is because the existing philosophy of science is a legacy of modern civilization. Characteristics of the philosophy of science inherited from modernity include its dichotomous and atomistic nature, or its fragmented view of the world [3]. From this perspective, a dichotomous form of knowledge was also created. This meant that one discipline of knowledge was disconnected from another. Science, for example, was directed solely toward materialistic goals within a positivistic framework. This nature of science was inherent from its inception. This can be seen in Bacon's slogan: "knowledge is power." This statement was later

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[1] "Paradigm Shift," in *The SAGE International Encyclopedia of Mass Media and Society* (2455 Teller Road, Thousand Oaks, California 91320: SAGE Publications, Inc., 2020), accessed June 26, 2025, https://sk.sagepub.com/reference/the-sage-encyclopedia-of-mass-media-and-society/i12854.xml.

[2] Albert J. Gabric, "The Climate Change Crisis: A Review of Its Causes and Possible Responses," *Atmosphere* 14, no. 7 (June 27, 2023): 1081.

[3] Matthias Posselt, "First-Principle and Atomistic Modelling in Materials Science," *Materials* 14, no. 6 (March 17, 2021): 1469.

criticized by Foucault. [4] Reinforcing the perspective that science rules and controls everything. As a result of this dichotomous-atomistic perspective, modern science has become unresponsive to the various impacts of the application of the knowledge it has developed. For example, in the case of mineral mining, which is highly exploitative of the environment. Mining activities have resulted in deforestation, habitat loss, carbon release, and several other impacts [5]. These mining activities are a reflection of how modern knowledge works, which is only oriented towards material things without considering its impact on life in general..

Therefore, a new design is needed in the construction of scientific knowledge, built through a paradigm that unifies the epistemological dimension (the system of knowledge design) with the axiological (the value aspects of knowledge). In this new design, the epistemological and axiological aspects are not only interconnected but also unified into a single whole. This unification will require the construction of knowledge that no longer separates the goals of science from ethical and aesthetic values. Every piece of knowledge directly incorporates moral and aesthetic considerations into its application. Peirce, James, and Dewey may have already discussed this when discussing the importance of the usefulness aspect of knowledge. However, in their view, usefulness only touches on the materialistic realm, neglecting aspects of feelings, collective well-being, justice, beauty, morality, and wisdom. It doesn't even address what Parsons called ultimate values..

The Basis of the Argument for the Unification of Epistemology and Axiology

The unification of epistemology and axiology was already part of Al-Farabi's thinking when discussing reason. In fact, the basis of this unification is already implicit in the concept of ontology he introduced. In his discussion of ontology, Al-Farabi emphasized four essences that possess existential independence: "that which exists" (wujud), the active intellect (al-'uqul al-fa'alat), the heavenly powers (al-quwwat al-samawiyat), and the human soul (al-nufus al-insaniyat).[6] Although independent, the four entities operating within their respective contexts share a similarity: they all lack causality or an initial cause. These four entities merely act as causes for one another. In the case of the human soul (selected because it is most relevant to the theme of this article), it is an abstract entity that predates the human body. It is from here that all things related to human thoughts, feelings, and actions originate. It is within this soul that what humans think, feel, and do is produced. It is also from here that happiness, the goal of an ideal state, is built.[7] Al-Farabi's idea of the human soul was heavily influenced by Aristotle, who held a monist view of the

[4] "Kritik Knowledge Is Power," n.d.

[5] Railh Gugus Tresor Massonini Ngoma et al., "The Impact of the Mining Equipment, Technological Trends, and Natural Resource Demand on Climate Change in Congo," *Sustainability* 15, no. 2 (January 16, 2023): 1691.

[6] "Alfarabi," n.d.

[7] "Alfarabi."

soul. For Aristotle, the soul is immortal and has no beginning or end.[8] Like Farabi, Aristotle also considered the soul as a place where humans process knowledge or what he called abstractions, such as physical, mathematical and metaphysical abstractions.[9]

The views of Aristotle and Al-Farabi opened up the possibility of a union between the human soul and body. This contrasted with the adherents of dualism, such as Plato, who assumed a separation between the soul and the body.[10] Plato's view was also held by Descartes who considered the human soul and body to be separate and connected by what is called the pineal gland.[11]

In Risalat fi al-'Aql, Al-Farabi implicitly affirms the interconnectedness of the soul and the body. The soul is an essential form that inhabits the body as its hymn. Al-Farabi explains::[12]

فالعقل الذي هو بالقوة هو نفس ما او جزء نفس او قوة من قوى النفس أو شيء ما ذاته معدة او مستعدة لان تنتزع ماهيات الموجودات كلها وصورها دون موادها فتجعلها كلها صورة لها او صورا لها وتلك الصور المنتزعة عن المواد ليست تصير" منتزعة عن موادها التي فيها وجودها الا بان تصير" صورا لهذه " الذات وتلك الصور المنتزعة عن موادها الصائرة صورا في هذه الذات هي المعقولات واشتق لها هذا الاسم من اسم " تلك الذات التي انتزعت صور الموجودات فصارت صورا لها . وتلك الذات شبيهة بمادة تحصل فيها صور الا انك اذا توهمت مادة ما جسمانية مثل : شمعة ما نقش فيها نقش فصار ذلك النقش وتلك الصورة في سطحها وعمقها واحتوت تلك الصورة على المادة باسرها حتى صارت المادة بجملتها كما هي باسرها هي " تلك الصورة بان" شاعت فيها الصورة قرب وهمك من تفهم معنى حصول صور الاشياء في تلك الذات التي تشبه مادة وموضوعا لتلك الصورة" وتفارق" سائر المواد الجسمانية بان المواد الجسمانية انما تقبل" الصور في سطوحها فقط دون اعماقها " وهذه الذات ليست تبقى ذاتها متميزة عن صور المعقولات حتى يكون لها ماهية منحازة والمصور التي ة فيها ماهية منحازة بل هذه الذات نفسها تصير تلك الصور" كما لو تو همت النقش والخلقة التي تخلق بها شمعة ما مكعبة أو مدورة فتخوص تلك الخلقة فيها وتشيع وتحتوى" على طولها وعرضها وعمقها باسرها " فحينئذ تكون تلك الشمعة قد صارت هي تلك الخلقة بعينها من غير ان يكون لها انحياز عاهيتها دون ما همة تلك الخلقة

In his explanation, Al-Farabi was not as detailed as Descartes, who stated that the soul and body were connected by certain glands. However, he did confirm that bodily activity correlates with the soul's activity. What is reflected in the body's behavior begins with what the soul thinks. The soul itself, although it is likely to absorb the body's experiences, still functions autonomously. The soul's ability to think rationally stems solely from its own potential. This explanation can be found in another of Al-Farabi's works, Kitab al-Nafs.[13] Al-Farabi emphasized the hierarchy that the soul or mind is superior to the body..

The union of soul and body is conceptualized in Aristotle's idea as Hylomorphism. The word Hyle lexically refers to the meanings of "wood" and "matter," while the word Morphe means "form."[14] *Aristotle intended Hyle as*

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[8] Thomas Kjeller Johansen, "Monism in Aristotle's Metaphysics I.3–5," *Peitho. Examina Antiqua* 12, no. 1 (December 13, 2021), accessed June 26, 2025, https://pressto.amu.edu.pl/index.php/peitho/article/view/30460.

[9] "Allan Back," n.d.; Johansen, "Monism in Aristotle's Metaphysics I.3–5."

[10] "Dualism," n.d.

[11] "Descartes and the Pineal Gland," n.d.

[12] Risalat al-'Aql

[13] https://doi.org/10.21608/fraz.2021.162925

[14] https://plato.stanford.edu/entries/form-matter/

something that precedes form, like letters precede words. However, unlike letters, Hyle is an immaterial essence. Hyle is then known because it manifests in morphe. In the context of the relationship between soul and body, Hyle is the soul, while morphe is the body.[15]

The basis of Aristotle's Hylomorphism stems from the question of the general principle of the changes in the forms of the elements in Empedocles' doctrine (water, earth, fire, and air): what is constant and possible in these changes? From this arises the idea of the essence of the four elements. This essence is constant and transcends form. A description of this essence is found in Aristotle's Physics. To explain the context of the soul and body (hylomorphism), Aristotle distinguishes two types of change: namely, changes in quality and quantity on the one hand, and substantial changes on the other.[16] For the first, Aristotle gives the example of Socrates falling into a blue liquid, causing his skin to turn blue and Socrates to gain weight due to overeating. For the second, Aristotle gives the example of Socrates' birth and death. Distinguishing between these two types of change is only possible if the soul and body are clearly defined.

This Aristotle's legacy of hylomorphism was adopted by Al-Farabi who also had the nickname muallim al-tsani (second teacher) after Aristotle.[17] For Aristotle, behind every form or body lies an eternal, immaterial structure, namely the soul. Form is a manifestation of the soul. There is no difference in this relation between soul and body between Aristotle and Al-Farabi.

The unity of soul and body in Al-Farabi's view is also a paradigm for the unification of ontology and epistemology of knowledge. This becomes clearer when Al-Farabi explains the structure of the body and accidents. In Al-Farabi's view, objects and accidents have six levels: the first cause or prime cause (al-sabab al-awwal), the second cause or cause of the occurrence of celestial bodies/planets (al-asbab al-tsawani), the fa'al intellect, the soul (al-nafs), form, and matter/body.[18] Three of the six levels are independent (they do not have a body and are not in a body). These three are: al-sabab al-awwal, al-sabab al-tsani, and fa'al reason.[19] Meanwhile, the next three levels are tied to specific bodies: the soul (al-nafs), the form (sura), and the body. The six categorized bodies here are: celestial bodies (al-jism al-samawi), humans (al-hayawan al-natiq), animals (al-hayawan al-ghai al-natiq), plants (al-nabat), minerals (al-jism al-ma'dini), and Empedocles' four elements (earth, water, air, and fire).[20]

Al-Farabi gives a special place to the Fa'al intellect as a substance that is able to make humans find true happiness.:[21]

والعقل الفعال فعله العناية بالحيوان الناطق و التماس تبليغه اقصى مراتب الكمال الذي اللانسان أن يبلغه وهو السعادة القصوى وذلك ان حصير الانسان في مرتبة العقل الفعال و انما يكون ذلك بأن يحصل

[15] Wlliam M.R. Simpson, *Cosmic Hylomorphism*, 2021.
[16] T Ainswort, 2016
[17] https://adamalemijournal.com/index.php/aa/article/download/135/75
[18] Al-Farabi, *Al-Syasat al-Madinah*, 2
[19] Al-Farabi, *Risalat al='Aql*, 3
[20] Al-Farabi, *Risalat al-'Aql*,6
[21] *Ibid*

حفارها للاجسام غير محتاج في قوامه الى شيء آخر مما هو دونه من جسم ومادة او عرض و ان يبقى على ذلك الكمال دائماً

Al-Farabi's assertion of the existence of active reason (al-'aql fa'al) which has the ability to achieve perfect happiness is an a priori form that closes the space for questions about process or method. In essence, active reason (al-'aql fa'al) sui generis already contains a definite potential and process. In the construction of active reason (al-'aql fa'al), ontology and epistemology are an inseparable unity. This active reason requires complex abilities and mastery of knowledge, as demonstrated by Al-Farabi himself who has produced various multi-disciplinary scientific literature, as described by Afifi:[22]

تل الفارابي في تاريخ الفلسفة الإسلامية مكانة بارزة، خاصة إذا وضعنا في اعتبارنا ما تركه من تراث فكرى غزير تمثل في مختلف العلوم التي كانت معروفة في عصره. فقد عالج مسائل الطبيعيات والإلهيات والمنطق والفلك والتنجيم والهندسة، والسياسة والأخلاق، هذا بالإضافة إلى علوم الدين كالفقه والكلام بحيث أصبحت كتبه خلاصة وافية للمعرفة فى عصره، وذلك بالإضافة إلى العديد من الآراء التي توصل إليها والتي لا تعد من جانبه مجرد ترديد الآراء من سبقوه

Apart from mastering various disciplines of knowledge, Al-Farabi also used four methods as sources of knowledge, namely sensory perception (ihsas), hypothesis (zann), analysis (istidlal), and reflection (ta'aqqul).[23] These four methods, although hierarchical in nature, must be applied intertwinedly when confronted with various facts. These four methods will lead the subject to a holistic understanding. Truth, although not explicitly elaborated by Al-Farabi, is implicitly present or emerges within this holistic knowledge.

Mastering holistic and multidisciplinary knowledge is essential for navigating life, confronting various challenges. Al-Farabi explained this when describing the competencies of an ideal leader. An ideal leader possesses the skills to lead the nation they lead to achieve shared goals: happiness, justice, and virtue.

The New Face of Knowledge Construction

The unification of ontology and epistemology within the concept of active reason (al-‘aql al-fa’al) provides the basis for a new face of knowledge that can address the climate crisis in the contemporary era. Implementing this unification within scientific construction leads to several things:

- Shift in scientific paradigm

Paradigms occupy a crucial position in scientific postulates. This is because they serve as the foundation that structures thought, the basis for assumptions, and the compass for how science is designed. The paradigms of science that have developed in the modern era are heavily influenced by Enlightenment philosophy, namely rationalism, empiricism, and positivism. These paradigms presuppose a distinctly separate and strictly distanced subject-object relationship. Subjects have the power to define and process objects according to systems and methods claimed to be scientific. There is no room for presenting truths other than these standards. Kant laid out such scientific claims in his book, The Critique of Pure Reason.[24] Before

[22] Zainab Afifi, *al-Falsafat al-Thabi’iyyat wa al-ilahiyat ‘inda al-Farabi* (Iskandariah: Dar al-Wafa’, 2002), 11

[23] Al-Farabi, *Kitab al-Jam’i Bayn al-Hikmayn* (Beirut: Dar al-Masyriq, 1986), 33

[24] https://plato.stanford.edu/entries/kant-science/

Kant, the so-called scientific approach lacked scientific legitimacy. After gaining scientific weight, the scientific method, based on rationalism, epistemology, and positivism, was also applied to all fields, including the humanities.[25] As a result, humanities studies approached with this paradigm experience distortion.[26] Because, after all, the humanities cannot be equated with the objects of natural science. The study of the humanities finally gained legitimacy as a separate field of study after Wilhelm Dilthey made an effort similar to Kant's, namely, laying scientific foundations in humanities knowledge. The relationship established in humanities knowledge does not assume a subject-object relationship as in natural science, but rather subjects with their own unique methods and approaches.

Throughout the era of modern civilization, the scientific systems of rationalism, empiricism, and positivism have developed and given rise to numerous innovations and technologies. This has given rise to a grand narrative about the greatness of science, capable of overcoming all of life's problems.[27] However, with the continuous development of humankind and the expansion of scientific knowledge, major crises have plagued human life one by one. One of these, as discussed in this article, is the climate crisis. In this area, the presence of science and technology has not solved the problems faced by humanity, but instead has presented a very worrying environmental crisis. In view of this, it is highly appropriate to reexamine the scientific paradigm that has served as an epistemic basis.

Based on Al-Farabi's thought, one proposal for reconstructing and reformulating the scientific paradigm is to incorporate transcendental wisdom into its framework. The transcendental wisdom referred to here is making God the primary framework of science. As is commonly understood, awareness of God in modern philosophy and science tends to be negated.[28] In fact, quite a few people say that the history of modernity is basically compatible with the history of the anti-metaphysical movement, including anti-God..

This differs from Al-Farabi's philosophy, which consistently considers God's existence as the cause and effect of God. Although, as previously mentioned, Al-Farabi deeply delved into interdisciplinary knowledge, he never neglected his awareness of God. In fact, Al-Farabi recommended theology (ilahiyat) as a compulsory subject to be studied, just as physics, mathematics, and logic are obligatory. Al-Farabi defined theology, as Ali Bou Melhem writes in the introduction to his book Ihsha' al-'Ulum:[29]

أما العلم الإلهى فيفحص عن الموجودات التي ليست بأحسام ولا في أجسام ، أي عن الموجودات المفارقة للمادة ، ويثبت وجودها وكثرتها وتراتيبها

From this understanding, theology is not the same as theological doctrine as understood by theologians (mutakallimun). Theology here is intended as an effort to understand "existent" things that are not material or exist within matter but whose

[25] https://philpapers.org/rec/DILITT

[26] *https://philosophia-bg.com/archive/philosophia-28-2021/relevance-and-criticism-of-social-scientific-methods-positivist-views/*

[27] *https://jurnalnasional.ump.ac.id/index.php/ISLAMADINA/article/download/14961/6471/55219*

[28] https://www.zygonjournal.org/article/13406/galley/27189/download/

[29] Ali Bou Melhem, "Pengantar", dalam Al-Farabi, *Ihsa' al-'Ulum* (Beirut: Dar wa Maktabah al-Hilal, 1996), 12

existence is related to material reality. In this discipline, there are two main themes discussed: the nature of what exists and the basic principles of science, such as the basic principles of logic, epistemology, and physics:[30]

وعدا ذلك يفحص العلم الإلهي عن موضوعين آخرين هما الموجود بما هو موجود، أي الجوهر، ومبادئ العلوم النظرية الجزئية كالمنطق وعلم التعاليم والعلم الطبيعي

Thus, Al-Farabi's theology is nothing more than the basic framework for all other disciplines. In the medieval Islamic era, as Al-Farabi also demonstrated, the integration of science and theology flourished. Muslim scholars typically also served as scholars, specializing in religious fields such as fiqh, tafsir, kalam, and the like.

Thus, if Al-Farabi's views are incorporated into the modern scientific paradigm, a new paradigm will be formed: the theocentric scientism paradigm. Within scientism, rationalism, empiricism, and positivism exist, synergizing with the divine paradigm. With this synergy, it is conceivable that a scientific system that tends to only view objects as ontic will also be understood as entities possessing essential aspects. Trees, rocks, minerals, water, mountains, and the like will not only be seen as inanimate objects, but also as objects possessing a hyle, just as the subject also possesses it. Therefore, every planned exploration and exploitation effort of the universe will consider the dimensions of the resulting effects, just as the effects when the subject is treated exploitatively..

- Curriculum overhaul with a scientific integration approach

In a modern education system, the curriculum is crucial. It outlines the orientation and teaching methodology an educational institution intends to implement. The word "curriculum" comes from the Greek words curir, meaning "runner," and curare, meaning "racecourse" or "distance to be covered."[31] These terms were then combined into curare which means “to run” or “to continue”.[32] The concept of curriculum in education in Europe began to be known in the 17th century, or the beginning of modern civilization. Leiden University and the University of Glasgow are noted as the first European universities to introduce this curriculum concept. However, if we look back, similar concepts of curriculum were already known in Islamic education systems, such as the Nizamiyah madrasah.[33] Many scholars have also written about the structure of knowledge that should be studied in educational institutions. Among these scholars, for example, is Jalal al-Din al-Syuyuthi in Itmam al-Dirayat li Qurrai al-Nuqayat.[34] Older campuses such as Cairo University have also long implemented concepts that are synonymous with this curriculum.[35]

As the world of education continues to advance, the existence of a curriculum as a direction for education has become a necessity. The curriculum contains essential components, such as educational objectives, learning foundations, a body of knowledge, subject structure, and models developed for learning practices. The success of an educational institution is also measured through this curriculum lens.

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[30] *Ibid*

[31] https://rkmsm.org/uploads/ckeditor_files/file/LMS/SB/Meaning,%20nature%20and%20scope%20of%20curriculum,%20Relationship%20between%20curriculum%20and%20syllabi.pdf

[32] *Ibid*

[33] https://rjfahuinib.org/index.php/tabuah/article/download/359/300/3622

[34] Al-Syuyuthi, *Itmam al-Dirayat li Qurra al-Nuqayat* (Beirut: Dar al-Kutub al-‘Ilmiyah, 1985), 4-5

[35] *https://pasca.jurnalikhac.ac.id/index.php/tijie/article/view/687*

In short, the curriculum in a modern education system is nothing more than a manual for educational programs, a learning philosophy, a scientific paradigm, and a code of conduct for knowledge transfer practices within the institution.

The curriculum structure of each educational institution may differ from one another. However, because education follows a scientific academic trajectory, the basic concepts of modern educational curricula share similarities across all modern educational institutions, especially those categorized as formal education. This similarity stems primarily from the assumptions surrounding what constitutes knowledge and what constitutes science. In other words, because the knowledge taught is based on a rational, empirical, and positivistic paradigm, the curriculum designed is also informed and structured by this paradigm.

Besides being based on a shared perspective on scientific knowledge and values, a shared curriculum is also shaped by a shared orientation. Educational institutions in the modern era are not solely focused on developing knowledge but are also oriented toward market needs.[36] Curriculum development is also based on market demands. In this context, educational institutions in the modern era have shifted from being loci of knowledge production and reproduction to being a kind of fabrication of human resources ready for use in the industrial world.[37] The academic credentials produced by educational institutions are nothing more than, what Bourdieu calls, symbolic modalities[38] which serves to safeguard interests and win competition in the industrial arena. As a result, the world of education has become a reflection of social status. If in social reality society is patterned by class structure, then the world of education is no different. The social groups that dominate social life naturally dominate the world of education. This is because these social classes do not want to lose access and position as the ruling social group or dominate other classes.

Gradually, the curriculum concepts designed in educational institutions followed the same social patterns. Curricula were developed solely focused on materialistic aspects and provided little space for other aspects, such as spirituality, art, culture, and the like. In fact, in some educational institutions, the humanities were gradually being pushed aside because they no longer met industrial needs.[39]

If we follow Al-Farabi's discussion of the structure of knowledge, he would not want a materialistic curriculum model. In his various works, Al-Farabi repeatedly states that humans do not live solely for material or worldly things, but also strive to attain immaterial things, such as happiness. If humans wish to achieve true happiness, they must also strive for the values of virtue, justice, and social welfare.[40] Among the processes that must be undertaken to achieve the values of virtue, justice, and social harmony is maximizing the potential for good and minimizing the potential for evil, especially evil that arises from evil desires, anger, and animalistic

[36] https://journals.sagepub.com/doi/10.1177/1478210317715814
[37] https://jurnal.uindatokarama.ac.id/index.php/iciis/article/view/3374
[38] https://www.sciencedirect.com/science/article/abs/pii/S0890406520300219
[39] https://jcom.sissa.it/article/pubid/JCOM_1802_2019_A04/
[40] Al-Farabi, *Kitab al-Sa'adah* (Hyderabad: Ottoman Encyclopedia Council Press, 1345 H), 4

desires. Al-Farabi emphasized the importance of developing a tranquil soul (muthma'innah) in humans. Al-Farabi described a tranquil soul as follows:[41]

النفس المطمئنة كمالها عرفان الحق الاول بادراكها فعرفا نها الحق الاول تنزيه قدسه على ما يتجلى له و هو اللذة القصوى - كل مدرك متشبه من جهة ما يدركه تشبه التقبل والاتصال فالنفس المطمئنة ستحاط معنى من اللذة الخفية على ضرب من الاتصال فترى الحق و تبطل من ذاتها فاذا رجعت الى ذاتها و آلت لها عرفت

A serene soul is one that knows and is close to God. This knowledge becomes awareness and the basis for behavior. Awareness of God's existence is perceived as pleasure (desire), much like the human pleasure a subject experiences when enjoying the pleasures of life. Here, knowledge of God does not stop at the level of discourse, but is also present in experience and behavior. This is certainly different from the educational curriculum concept in modern schools. In this concept, knowledge of God is merely an object of cognition, absent from awareness and action. This thesis may not apply to traditional educational systems, such as Islamic boarding schools or Sufi circles. In this latter educational model, knowledge of God does not stop at the realm of discourse, but also grows and develops through experience and action. Al-Farabi's view on the importance of divine knowledge is as follows:[42]

وينبغى ان يكون العلم الا لهي داخلا في هذا العلم لان الله مبدأ للموجود المطلق لا لموجود دون موجود فالقسم الذي يشمل منه على اعطاء مبدأ الوجود ينبغى أن يكون هو العلم الالهى ولان هذه المعاني ليست خاصة بالطبيعيات بل هى اعلى من الطبيعيات عموما فهذا العلم اعلى من علم الطبيعة و بعد علم الطبيعة فلهذا وجب أن يسمى علم ما بعد الطبيعة والعلم التعاليمي وان كان اعلى من علم الطبيعة اذ كانت موضوعاته مجردة عن المواد فليس ينبغى ان يسمى علم ما بعد الطبيعة لان تجرد موضوعاته عن المواد و همي لا وجودى واما في الوجود فليس لها وجود الا فى الامور الطبيعية واما موضوعات هذا العمل فمنها ما ليس له وجود البتة في الطبيعيات لا وهمى ولا حقيق وليس انما جردها الوهم عن الطبيعيات فقط بل وجودها وطبيعتها انها مجردة ومنها ما يوجد في الطبيعيات وان كان يتوهم مجرد عنها ولكن ليس يوجد فيها بذاتها بحيث لا يتعرى عنها وجود ها و تكون امورا قوامها بالطبيعيات بل يوجد للطبيعيات ولغير الطبيعيات من الامور المفارقة بالحقيقة او المفارقة بالوهم فاذا العلم المستحق لان يسمى بهذا الاسم هو هذا العلم فهو اذن وحده دون صائر العلوم علم ما بعد الطبيعة والموضوع الأول لهذا العلم هو الموجود المطلق مقالة في اغراض ما بعد الطبيعة.

Knowledge and awareness of God within the context of the curriculum does not mean designing education solely theocentrically, as in the scholastic era. Nor is it intended to shape students with fideist and fatalistic views. Al-Farabi also strongly encouraged the development of intellectual power (al-quwwat al-fikriyat) to the fullest. Al-Farabi believed that this type of power is capable of directing humans toward values, both beneficial and harmful, including leading to happiness. Al-Farabi stated:[43]

و اكمل ما تكون القوة الفكرية متى كانت انما تستنبط لتنفع الاشياء في تحصيلها وربما كانت خيراً في الحقيقة وربما كانت شراً وربما كانت خيرات مظنونة انها خيرات فاذا كانت الاشياء التي تستنبط هي انفع الامور في غابة ما فاضلة كانت الاشياء التي تستنبط هي الجميلة و الحسنات السعادة

[41]Al-Farabi, *Kitab al-Fusus,* (Hyderabad: Ottoman Encyclopedia Council Press, 1345 H),7

[42] Al-Fsarabi, *Risalat al-'Aql,* 5-6

[43] Al-Faranbi, *Tahsil al-Sa'adah* (Hyderabad: Ottoman Encyclopedia Council Press, 1345 H), 30

و اذا كانت الغايات شر ورا كانت الاشياء التي تستنبط بالقوة الفكرية
شروراً ايضا و امور اقبيحة و سيئات*
و اذا كانت الغايات خيرات مظنونة كانت الاشياء النافعة في حصولها
و بلوغها خيرات ايضا مظنونة

Considering the potential of probabilistic intellectual power between good and bad, Al-Farabi then divided this power into two types, namely intellectual power which can take the good aspects of objects and intellectual power which only makes objects a means to do bad things.[44]

Both the soul and the mind, as well as the power of the intellect, can be cultivated through the process of learning (ta'lim). Al-Farabi defined this learning as the process of discovering the theoretical construction of knowledge. He explains this in the following quote:

والتعليم هو امجاد الفضائل النظرية في الامم و المدن والتأديب هو طريق ايجاد الفضائل الخلقية والصناعات العلمية في الامم والتعليم هو بقول فقط والتأديب هو ان يعود الامم والمد ينون الا فعال الكائنة عن الكائنة عن الملكات العلمية بأن تنهض عزا مهم نحو فعلها وان تصير تلك وافعالها مستولية على نفوسهم ويجعلوا كما لما شقين لها وانهاض العزائم نحو فعل الشيء ربما كان يقول وربما كان يفعل

The material objects in the learning process include social, civil, and ethical issues. These three material objects serve no other purpose than to discover theories related to virtue that are applicable to the common good. Virtue here is theoretical and scientific, not strictly doctrinal. Theoretical and scientific constructions are congruent with the spirit of science, philosophy, and the character of quwwat fikriyat. Although in this description the material objects of ta'lim consist of only three types of knowledge, Al-Farabi does not limit them to these three types. In several other explanations, Al-Farabi strongly recommends mastering other disciplines, such as Physics, Mathematics, Logic, and Theology.

Regarding the structure of knowledge, Al-Farabi divided it into two major clusters: universal knowledge (kulliyat) and partial knowledge (juziyyat). The following is Al-Farabi's statement regarding partial knowledge:[45]

(فنقول) ان العلوم منها جزئية ومنها كلية والعلوم الجزئية هي التي موضوعاتها بعض الموجودات او المو هو مات ويختص نظرها بإغراضها الخاصة بها مثل علم الطبيعة فانه ينظر في بعض الموجودات وهو الجسم من جهة ما يتغيروتحرك و يسكن عن الحركة ومن جهة ماله .. ادى ذلك ولو احقه وعلم الهندسة ينظر في المقادير من جهة ما يقبل الكيفيات الخاصة بها والاضافات الواقعة فيها وكذلك علم الحساب في العدد وعلم العاب في الابدان الانسانية من جهة ما يصيح ويسقم وغير ذلك من العلوم الجزئية وليس الشيبي منها النظر فيما يهم جميع الموجودات.

This category is created based on the object's identity, method, and objectives in studying it. The partial scientific category (juziyyat) is based on its object, which is partly empirical and partly essential. The methodological tools used are specific with specific objectives, such as physics, which studies objects that are partly empirical, such as their changes and movements. It also assesses qualities that are invisible to the senses. Besides physics, there are also geometry, mathematics, and medicine,

[44] *Ibid*, 33
[45] Al-Farabi, *Maqalat fi Aghrad Ma Ba;da al-Thabi'at* (Hyderabad: Ottoman Encyclopedia Council Press, 1345 H),4

which have unique methodologies for generating theories about the objects they study.

This scientific character differs from the category of universal knowledge (kulliyat), which attempts to explore the general dimensions and assumptions of the general principles of reality. The objects of this type of knowledge are abstract and use speculative methods. Al-Farabi further argued:[46]

> واما العلم (الكلى فهو ينظر فى الشيء العام بجميع الموجودات مثل الوجود والوحدة و في انواعه ولوا حقه وفى الاشياء التي لا يعرض بالتخصيص لشيء شيء من موضوعات العلوم الجزئية مثل التقدم والتأخر و القوة والفعل والتام والمناقص وما يجرى مجرى هذه وفي المبدأ المشترك الجميع الموجودات وهو الشيء الذي ينبغى ان يسميه باسم الله جل جلاله و تقدست مقالة في اغراض ما بعد الطبيعة

An example of kulliyat knowledge mentioned by Al-Farabi is the search for the substance of reality, its types, and qualities, which differs from what is usually applied to jusiyat knowledge. In short, this type of knowledge answers fundamental questions in metaphysics, such as describing what existence is, how existence is possible, and the like. This knowledge also includes the essence of divinity, such as the essence of God, His attributes, and all that is intertwined with His existence.

A closer look at this categorization reveals that Al-Farabi advises that the study of science should not be limited to empirical matters. Knowledge should also be directed toward abstract issues that may have no relevance to pragmatic interests. Why should we study the abstract so that humans can gain a comprehensive and in-depth understanding of reality? The curriculum implemented in the modern education system does not allow for this kind of knowledge. One reason, besides being complicated and based on speculation, may also be its lack of pragmatic value. Kulliyat knowledge lacks definitive measures, both in terms of process and its outcomes. Meanwhile, the modern education curriculum places a strong emphasis on certainty in both process and outcomes, allowing for accurate measurement, calculation, and prediction.

This positivistic curriculum contributes to the reproduction of knowledge that has given rise to current environmental damage. One of the causes is that the mainstream science of juziyyat (literary science) only produces a specific understanding of objects. For example, physics only captures empirical qualities without addressing the deeper dimensions of essence and substance. These qualities are the basis for applications, such as the exploitation of nature and so on. If learning could penetrate the dimension of substance or essence, perhaps more considerations would be taken into account before shifting knowledge from theory to practice. At the very least, considering essential aspects would give rise to ethical, aesthetic, and even theological considerations in practice. Exploring nature may be theoretically correct, but it can be fatally wrong when viewed through the lens of ethics, aesthetics, and theology.

- -Strengthening ethics in life

As mentioned previously, another important aspect to include in any discussion of knowledge is ethics. Al-Farabi is also noted for his extensive discussion of ethics. His interest in this discipline was undoubtedly heavily influenced by Plato and

[46] *Ibid.*

Aristotle. In his book Kitab al-Jam' Bayn al-Hikmayn, Al-Farabi explains his views on Plato's and Aristotle's ethical concepts. He writes:[47]

ومن ذلك ايضاً ، امر اخلاق النفس ، وظنهم بان رأي ارسطو مخالف لرأي افلاطون . وذلك ان ارسطو يصرح في كتاب و نيقوما خيا ، ان الاخلاق كلها عادات تتغير ، وانه ليس شيء منها بالطبع ، وان الانسان يمكنه ان ينتقل من كل واحد منها الى غيره بالاعتياد (١٣٠) والدرية - وافلاطون يصرح في كتاب و السياسة : و في كتاب (بوليطيا » (١٣١) خاصة بان الطبع يغلب العادة ؛ وان الكهول حيثما (١٣٢) طبعوا على خلق ما ، يعسر زوالهم عنه ؛ وانهم متى قصدوا زوال ذلك التخلق عنهم ازدادوا فيه تمادياً ويأتي على ذلك بمثال من الطريق : اذا لبت فيه الدخل والحشيش والشجر معوجة ، متى قصد خلاء الطريق منها او ميل الشجر الى جانب آخر ، فانها اذا خليت سبيلها اخذت من الطريق اكثر مما كانت الخذت قبل ذلك

Plato and Aristotle's ethical ideas differ significantly. Aristotle viewed ethics as a dynamic process. A person becomes good through habit or practice. Plato, on the other hand, viewed ethics as inherent and unchangeable. Plato gave the example of an elderly person whose habits were difficult to change. Seeing this dualistic view, Al-Farabi attempted to critically examine both. According to Al-Farabi, Aristotle argued that ethics can be formed through practice because he was referring to law, in this case civil law. Law, as a set of normative rules, does have the power to regulate or transform an anomalous situation into a regular one. In such a legal context, Aristotle's assertion that a person's moral behavior can be changed is valid. Plato, on the other hand, viewed ethics in terms of one's experiences. For Plato, someone raised in a particular moral environment would be difficult to change. Aristotle himself, Al-Farabi said, confirmed Plato's view in certain cases.[48]

Regarding ethics, Al-Farabi believes that humans have the potential to think and carry out good actions.[49] Potential exists within humans from birth. Within this potential, humans possess the ability to consider good things and act within the correct moral framework, according to Al-Farabi:[50]

فالخلق الجميل وقوة الذهن هما جميعا الفضيلة الانسانية من قبيل ان فضيلة كل شيء هي التي تكسبه الجودة والكمال في ذاته تكسب افعاله جودة - وهذان جميعا هما للذان اذا حصلا حصلت لنا الجودة والكمال في ذواتنا وافعالنا فيها نصير نبلاء خيارا فاضلين و بهما تكون سيرتنا في جيوتنا سيرة فاضلة وتصير جميع تصرفاتنا تصرفات محمودة

Al-Farabi's a priori ethical view is compatible with the voice of conscience or the categorical imperative from a Kantian perspective. Although it has drawn much criticism, this ethical view has advantages. Among them are the universality of morality and the co-consistency of good values. This type of ethical claim is relatively easy to integrate into educational curricula that emphasize standardized guidelines, as the assumption of good and evil is universal. What needs to be addressed in the learning process is how each discipline taught is connected to moral values. Natural sciences (physics, chemistry, biology, medicine, and so on) operate not only within methodological and theoretical frameworks but also encompass ethical aspects. This connectivity will ultimately serve as a control system to ensure

[47] Al-Farabi, *Kitab al-Jam',* 95
[48] *Ibid*
[49] *Ibid*
[50] Al-farabi1, 7

that theoretical products do not conflict with the spirit of environmental conservation.

CONCLUSION

Al-Farabi was a Muslim philosopher who wrote extensively on reason and knowledge. Among his ideas was the concept of the active intellect. This intellect enables the integration of various human faculties, ranging from logical to ethical thinking. In this way, Al-Farabi indirectly introduced the concept of the integration of knowledge.

Such integration of knowledge—that is, bringing together cognitive and ethical values—is crucial today for addressing the global challenges facing humanity, such as the environmental crisis or the climate crisis. This integration offers practical guidance on how the application of knowledge can prevent further damage to the natural world.

Using the Farabian approach, there are at least two things that can be done in the current educational context. Namely: 1) shifting the paradigm of science from an atomistic to an integrative one; 2) constructing a curriculum that reflects the integration of cognition and ethics.

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