



PARADIGMS AND RATIONALITY: A CRITICAL STUDY OF THE THOUGHTS OF THOMAS KUHN AND IBN RUSHD

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Abstract

This article critically examines the thoughts of Thomas Kuhn and Ibn Rushd in order to understand the epistemological structure and dynamics of science, by highlighting two fundamental concepts: paradigm and rationality. Thomas Kuhn, through his theory of *scientific revolutions*, argued that the development of science does not occur linearly and cumulatively, but rather through paradigm leaps triggered by internal crises in the scientific community and resolved through collective consensus. On the other hand, Ibn Rushd, as a representative of rationalist philosophers in the classical Islamic thought treasury, places reason and logic as universal epistemic foundations in revealing scientific truth, and firmly rejects the dominance of theological authority that hinders freedom of thought. This study reveals that although both come from different traditions and historical contexts, there is a common ground in the critical attitude towards intellectual stagnation and the drive to open up space for renewal of thought. However, epistemologically, both show sharp divergences: Kuhn is based on contextual paradigmatic relativism, while Ibn Rushd is rooted in transhistorical rational objectivism. Using a comparative-philosophical approach, this article concludes that a critical synthesis of the two views can enrich contemporary discourse on the foundations and direction of the development of science.

Keywords: Epistemology, Ibn Rushd, Authority of Science, Paradigm, Rationality, Thomas Kuhn

Abstrak

Artikel ini mengkaji secara kritis pemikiran Thomas Kuhn dan Ibnu Rusyd dalam rangka memahami struktur serta dinamika epistemologis ilmu pengetahuan, dengan menyoroti dua konsep fundamental: paradigma dan rasionalitas. Thomas Kuhn, melalui teorinya mengenai *scientific revolutions*, mengemukakan bahwa perkembangan ilmu pengetahuan tidak



berlangsung secara linear dan kumulatif, melainkan melalui lompatan paradigma yang dipicu oleh krisis internal dalam komunitas ilmiah dan diselesaikan melalui konsensus kolektif. Di sisi lain, Ibnu Rusyd, sebagai representasi filsuf rasionalis dalam khazanah pemikiran Islam klasik, menempatkan akal dan logika sebagai fondasi epistemik yang bersifat universal dalam menyingkap kebenaran ilmiah, serta secara tegas menolak dominasi otoritas teologis yang menghambat kebebasan berpikir. Studi ini mengungkapkan bahwa meskipun keduanya berasal dari tradisi dan konteks historis yang berbeda, terdapat titik temu dalam sikap kritis terhadap stagnasi intelektual dan dorongan untuk membuka ruang pembaruan pemikiran. Namun demikian, secara epistemologis, keduanya menunjukkan divergensi yang tajam: Kuhn berpijak pada relativisme paradigmatis yang kontekstual, sedangkan Ibnu Rusyd berakar pada objektivisme rasional yang transhistoris. Dengan menggunakan pendekatan komparatif-filosofis, artikel ini menyimpulkan bahwa sintesis kritis atas kedua pandangan tersebut dapat memperkaya diskursus kontemporer mengenai fondasi dan arah perkembangan ilmu pengetahuan.

Kata kunci: Epistemologi, Ibn Rushd, Otoritas Ilmu, Paradigma, Rasionalitas, Thomas Kuhn

1. INTRODUCTION

Understanding science is not only related to the accumulation of empirical data, but also includes the rational and conceptual framework that underlies the scientific process itself. In the context of the philosophy of science, two concepts that play a fundamental role in structuring the way humans understand reality are *paradigm* and *rationality*. Both are important fields of reflection in reading epistemological dynamics over time. In this case, the thoughts of Thomas Kuhn and Ibn Rushd are two significant and contrasting representations in interpreting the building of science.

Thomas Samuel Kuhn (1922-1996), a leading physicist and philosopher of science of the 20th century, in his major work *The Structure of Scientific Revolutions*, shifted the conventional view of the history of science which was previously considered linear, cumulative, and objective. Kuhn introduced the idea that the development of science is actually marked by paradigmatic disjunctions, namely fundamental changes in the framework of scientific thinking that arise from the accumulation of anomalies and crises that cannot be explained by the old paradigm. Paradigm shifts, according to Kuhn, are not the result of a rational-logical process alone, but rather of a social-collective process in the scientific community, which makes scientific truth relative to the dominant paradigm structure at that time (Kuhn, 1970, pp. 52-91). Meanwhile, Ibn Rushd (1126–1198), as one of the figures of rationalism in the classical Islamic philosophical tradition, argued that science must be based on objective rationality rooted in reason as a universal epistemic instrument. In his various philosophical works, such as *Fashl al-Maqāl* and *Tahāfut al-Tahāfut*, he emphasized the importance of freedom of thought as an absolute requirement for the advancement of science, and critically rejected the dominance of theological authority that denied the role of reason in understanding reality (Fakhry, 2004, pp. 269-302). For him, reason and revelation were not opposing entities, but complemented each other in an integral epistemological framework.



This study is significant because although both thinkers emerged from very different intellectual traditions—Kuhn in the context of modern science and Ibn Rushd in the tradition of classical Islamic philosophy—both challenged old authorities and opened up possibilities for the renewal of scientific thought. Their similarities lie in their critical drive against intellectual stagnation and their reluctance to submit to rigid authoritative structures. However, epistemologically, they are on different spectrums: Kuhn tends to place science within the framework of paradigmatic relativism that is historical-contextual, while Ibn Rushd remains grounded in rational objectivism that is transhistorical and universal.

Through a comparative-philosophical approach, this article attempts to explore the meeting points and divergences between paradigm and rationality as understood by Kuhn and Ibn Rushd. In doing so, it is hoped that a critical synthesis will be born that not only enriches the study of the philosophy of science, but also contributes to contemporary epistemological reflection on the foundations, directions, and ethics of the development of science.

2. RESEARCH METHOD

Having examined the thoughts of Thomas Kuhn and Ibn Rushd separately, the next logical step is to compare the two in the realm of epistemology and its implications for the structure of science. Although coming from different historical backgrounds, cultures, and intellectual traditions, Kuhn from the contemporary Western philosophical tradition and Ibn Rushd from classical Islam both touch on the same fundamental issues: how science develops, what is the basis of the legitimacy of scientific truth, and what is the role of authority in constructing or even limiting knowledge.

In terms of epistemology, the most fundamental difference between Kuhn and Ibn Rushd lies in the orientation towards objectivity. Kuhn highlighted that science does not develop linearly towards universal objective truth, but rather through a paradigm shift that is incommensurable and cannot be compared within the same logical framework. In other words, scientific truth according to Kuhn is contextual and determined by the consensus of the scientific community at a certain period. Science, in this view, is not a direct reflection of reality, but rather the result of social construction formed through collective norms, values, and beliefs (Fuller, 2000, pp. 174-178).

In contrast, Ibn Rushd actually bases his belief in the existence of universal rationality that allows humans to reach the truth through the use of reason. In his epistemological system, the validity of knowledge can be tested through formal logic and demonstrative deduction methods. He affirms that reality is coherent and can be understood by human reason because the order of nature reflects divine rational principles. Therefore, Ibn Rushd rejects relativism and supports an objective rational approach as a stable foundation for building knowledge.

Despite these striking differences, both share a criticality toward the dominance of stagnant authority. Kuhn, for example, shows how scientific communities can become conservative when they become too attached to old paradigms and reject anomalies that threaten the stability of established theories (Kuhn, 1970, pp. 76-86). This gives rise to a kind



of scientific dogmatism similar to the religious authority criticized by Ibn Rushd. In the context of medieval Islam, Ibn Rushd confronts religious institutions that reject philosophy on the basis of theological literalism. He advocates the liberation of reason from the dominance of narrow textual interpretation, asserting that philosophy does not contradict the Shari'a but rather complements it.

Another point of intersection is seen in their critique of the illusion of neutrality in scientific or religious practice. Kuhn rejects the view that science is value-free; he argues that the choice of paradigm is heavily influenced by external factors such as the history, culture, and psychology of the scientific community (Hoyningen-Huene, 1993, pp. 192-197). This critique parallels Ibn Rushd's attempt to reveal that religious interpretations are often not free from political or ideological interests. Both emphasize the importance of critical reflection on the dominant viewpoints in a community, whether scientific or theological.

However, the orientation towards change is also different. Kuhn sees scientific revolutions as discontinuous phenomena born from paradigm crises and conflicts. The transition to a new paradigm is not due to logical superiority, but rather to a shift in collective beliefs. Meanwhile, Ibn Rushd views the development of science as an accumulative process towards truth, as long as human reason is used optimally. He believes that each generation of scientists builds on the legacy of previous knowledge, by correcting errors without having to radically destroy the old system (Fakhry, 2004, pp. 307-310).

From here it appears that Kuhn is leading to epistemic pluralism that opens up space for relativism, while Ibn Rushd maintains rational monism, where one legitimate method of knowledge is deductive logic developed by classical philosophy. Consequently, Kuhn relativizes scientific claims to the structure of the community, while Ibn Rushd ties truth to a universal logical structure.

However, this does not mean that Kuhn's contribution is irrelevant in the context of Ibn Rushd's thinking. In fact, both complement each other in building a critical understanding of science. Kuhn teaches the importance of sociological and historical dimensions in knowledge, while Ibn Rushd emphasizes the firmness of reason in assessing the validity of truth claims. Thus, the meeting of their thoughts offers a synthesis between sensitivity to social context and commitment to the logical structure of rationality.

3. RESULTS AND DISCUSSION

In this chapter, the researcher presents the data from the research conducted. The research instruments in this study consisted of pre-test and post-test. Hypothesis testing with SPSS 25 includes mean scores, and significant t-tests. The kind of test was multiple choice and essay. The total number of questions in each test was 15, which consists of 10 multiple choice and 5 essays. For the assessment, each correct answer was awarded one point in multiple choice questions, while the essay test was worth five points. The result of the test can be seen as follows:



Thomas Kuhn and the Concept of Paradigm Revolution

Thomas Kuhn's thinking was born as a response to the dominance of the positivistic paradigm in the philosophy of science in the 20th century, which at that time believed that the development of science proceeded linearly and accumulatively through empirical verification and logical deduction. Logical-positivists such as Rudolf Carnap and the *Vienna Circle* even described science as a neutral, value-free activity, and free from social construction (Chalmers, 2013, pp. 7-10). This opinion later formed the foundation for many philosophical theories about the objectivity of science.

However, Kuhn, with his background as a physicist and historian, offered a radical critique of this view. He found that the history of the development of science actually showed patterns of change that were not always continuous and full of revolutions. In his influential work, *The Structure of Scientific Revolutions*, Kuhn proposed the concept of *paradigm* as a conceptual framework held by the scientific community in understanding reality (Chalmers, 2013, pp. 10-11).

This paradigm is not just a scientific theory, but includes values, assumptions, and methods that bind scientists together in a consensus. During the period he called *normal science*, scientists work under the umbrella of the ruling paradigm, solving technical problems that support the existing theory. They do not question the basis or assumptions of the theory in use.

Over time, in the process of *normal science*, phenomena or data emerge that do not match the predictions of the theory, called anomalies (Chalmers, 2013, pp. 52-56). In the early stages, anomalies are usually ignored or considered methodological errors. However, if anomalies continue to emerge without adequate solutions, trust in the paradigm begins to erode, and the scientific community experiences a crisis. This crisis is the starting point for the emergence of *scientific revolutions*, namely the moment when the old paradigm is replaced by a new paradigm that offers a broader explanatory framework.

It is at this point that Kuhn introduces the concept of *incommensurability*, which states that old and new paradigms cannot be directly compared because they use different assumptions and scientific languages (Chalmers, 2013, pp. 103-110). Paradigm shifts do not occur through rational evaluation alone, but often through social dynamics and consensus.

The implication of this theory is the problematization of the claim of scientific objectivity. If the validity of a theory depends on the dominance of a paradigm, then objectivity is no longer absolute, but historical and bound by cultural and social contexts. Although Kuhn was not openly a relativist, many believe that his theory opens up this space.

His thinking sparked a long debate. Some appreciated his contribution in seeing science as a social practice, but many also criticized him for reducing science to a mere "agreement" of the scientific community that could change at any time (Fuller, 2000, pp. 115-120). Nevertheless, Kuhn remains an important figure who forced the academic world to be more reflective and critical of the way they understand science.



Ibn Rushd and Rationality in Islamic Tradition

Ibn Rushd (1126–1198 CE), known in the West as Averroes, was a great thinker from Andalusia who contributed significantly to the integration of rational philosophy with Islamic teachings. He emerged as a defender of reason in the face of theological tendencies that tended to limit the autonomy of thought in the Islamic world. His work asserted that a rational approach was not only legitimate but also necessary in interpreting reality and revelation.

In Ibn Rushd's framework of thought, reason is not an antagonist to the sacred text, but rather an equal partner in the effort to understand the truth. In *Fashl al-Maqāl*, he states that reason is an important instrument that is actually ordered by revelation to be used optimally. Therefore, thinking philosophically is not a violation of religion, but another form of deep obedience. This view emphasizes that in Islam, reason and revelation should synergize, not negate each other.

This idea led Ibn Rushd to defend the demonstrative method of thinking (*burhānī*), an approach built on the foundation of Aristotelian logic that he considered the most reliable way to attain valid knowledge. He doubted the dialectical and rhetorical approaches because they did not offer logical certainty, and opened up room for errors in epistemic reasoning (Fakhry, 2004, pp. 301-305). Thus, Ibn Rushd confirmed the position of reason as the main reference in interpreting phenomena, both natural and spiritual.

As a continuation of this argument, Ibn Rushd opposed the dominance of the theological-dogmatic approach which he considered to hinder freedom of thought. In his work *Tahāfut al-Tahāfut*, he criticized Al-Ghazali who considered philosophy as a threat to faith. Ibn Rushd reversed this argument by showing that the philosophical framework of thought is in line with the principles of revelation, as long as it is interpreted rationally and contextually. He reminded that a literal approach to religious texts often leads to misunderstandings, and therefore requires a deeper method of interpretation, such as *ta'wīl*, which is based on rational considerations (Leaman, 1988, pp. 112-123).

Ibn Rushd's critique of orthodox theology did not stop at the methodological aspect, but also reached its epistemological roots. He argued that science should not be constrained by the authority of religious institutions that do not open up space for rational discourse. Unlike theologians who rely on the authority of texts, Ibn Rushd emphasized that reason can reach universal principles through logical deduction and systematic observation of reality.

In this regard, Ibn Rushd's position is in stark contrast to Thomas Kuhn's thinking. Kuhn views scientific theories as influenced by social structures and the consensus of the scientific community, which can change with changes in paradigm. Meanwhile, Ibn Rushd believes that truth is fixed and can be achieved objectively through reasoning. He rejects epistemic relativism and relies on the principle of internal coherence and deductive logic as the main foundation for the pursuit of knowledge (Taylor, 2020).

This view is in line with his view of natural law and the order of the cosmos. For him, the universe is subject to fixed rational principles and can be understood through the structure of human reason. The concepts of causality, substance, and final form, which are part of



Aristotle's philosophy, are important elements in building Ibn Rushd's epistemology. With this approach, he believes that science develops progressively towards truth, not based on the instability of social paradigms .

Ibn Rushd's thought not only had a major impact on the Islamic tradition, but also had a wide influence in the West. Through his interpretations and commentaries on the works of Aristotle, he became a key figure in the intellectual revival of Europe, especially in the Middle Ages. European universities made Ibn Rushd's interpretations the main reference in the study of philosophy and logic, even surpassing the influence of Aristotle himself in some circles (Renan, 1900, pp. 217-226).

In the contemporary era, Ibn Rushd's legacy of thought remains relevant, especially in the face of the challenges of fundamentalism and anti-intellectualism. He showed that freedom of thought is an integral part of mature faith, not a deviation from religion. By rejecting dogmatic absolutism and promoting freedom of reason, Ibn Rushd offered a scientific paradigm that upholds universal rationality within a framework of ethics and spirituality.

Epistemological Comparison and Paradigmatic Implications between Thomas Kuhn and Ibn Rushd

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Table 1. Epistemological Comparison between Thomas Kuhn and Ibn Rushd

Aspect	Thomas Kuhn	Ibn Rushd
Traditional Background	Modern Western philosophy of science	Classical Islamic philosophy
Epistemology	Contextual and historical; relative to the paradigm	Rational-objective; universal through reason and logic
The Concept of Scientific Truth	Not absolute; depends on the dominant paradigm of the scientific community.	Is permanent and can be achieved through common



		sense and logical demonstration.
Model of Science Development	Discontinuity (paradigm revolution)	Cumulative and coherent (progressive rationality)
Views on Authority	Criticism of dogmatic scientific authority and resistance to anomalies	Criticism of religious authority that limits rationality and philosophy
The Social Role of Science	Science is influenced by norms, values, and social dynamics of the community.	Science should guide society with reason as its guide
Paradigm Shift	Fueled by crisis and social consensus; not entirely rational	Change through rational refinement; not total revolution
Attitudes towards Relativism	Opening up space for relativism through incommensurability	Rejecting relativism; affirming reason as a universal tool of knowledge.
Philosophical Implications	Raising awareness of the social construction of science and the importance of paradigmatic critique	Affirming the importance of logic and philosophy in scientific and religious life

Contemporary Implications of Kuhn and Ibn Rushd's Thought on Academic Freedom and Scientific Reform

Bringing the discussion from the theoretical realm to the contemporary context, the thoughts of Thomas Kuhn and Ibn Rushd present a very strong relevance in understanding the challenges faced by the contemporary academic and scientific world. These two thinkers, although separated by space and time, both voice the importance of autonomy of thought in facing the hegemony of established discourse. In a world where educational and research institutions are often under institutional, political, or ideological pressure, the legacy of Kuhn and Ibn Rushd's ideas becomes a lantern that leads towards intellectual liberation.

Kuhn's thinking teaches that the dominant paradigm in science can block the emergence of new ideas that deviate from the framework of scientific orthodoxy. In the context of modern universities, this can be seen in the tendency of the academic world to uphold "scientific standards" which are essentially a form of epistemic power. Students and young researchers are often encouraged to "play it safe" within the corridors of established paradigms in order to gain recognition or funding, while radical innovations or cross-disciplinary approaches are often considered illegitimate or even deviant. This is where Kuhn's critique becomes significant—he reminds us that the development of science is not just the accumulation of data, but also the courage to overhaul patterns of thinking.

In contrast, Ibn Rushd offers a more normative perspective, emphasizing the importance of rational foundations in establishing legitimate scientific authority. In the modern context, this approach is crucial in responding to the proliferation of information and opinions



that are not based on rigorous scientific methods. Amidst the current of post-truth and the spread of hoaxes, Ibn Rushd's ideas about the importance of demonstrative logic and rational epistemic validity are the foundation for maintaining academic integrity (Leaman, 1988, pp. 157-162). He reminds us that freedom of thought should not mean freedom from intellectual responsibility. Every claim must be tested through common sense, systematic argumentation, and rational evidence.

Academic freedom, in this context, should be seen not only as the right to think freely, but also as a space to fight against scientific stagnation. Kuhn showed that the scientific community, rather than guaranteeing the development of knowledge, can actually become an obstacle if it is exclusive to new ideas. When freedom of thought is limited by pseudo-consensus or rigid publication standards, the chances for a paradigmatic revolution become smaller. Therefore, educational and research institutions must be more open to alternative, critical and interdisciplinary approaches .

Meanwhile, the lessons of Ibn Rushd underline that the courage to think must be supported by a strong scientific tradition and an educational system that fosters reason. In many contexts of the contemporary Islamic world, textual and dogmatic approaches to understanding religious knowledge are still the mainstream, and this often marginalizes rational methods. Ibn Rushd offers an epistemological correction by asserting that revelation should not be separated from reason; both must go hand in hand in forming a scientific and spiritual worldview (Ibn Rushd, 2001, pp. 89-94). In a modern pluralistic society, this kind of thinking can be a bridge between faith and rationality, between tradition and modernity.

The practical implication of these two thinkers is the need for reform in the way academic institutions view and manage science. Kuhn suggested that the scientific evaluation system be more open and reflective, not based solely on the quantity of publications or citation index, but also on the extent to which an idea raises fundamental questions or offers a new lens for viewing reality . Meanwhile, Ibn Rushd inspired a curriculum reform that placed logic and philosophy as core subjects, so that the intellectual generation would not only master information, but also be able to reason and argue elegantly.

In the midst of today's complex epistemic debate between science and postmodernism, between tradition and secularism, the thinking of Kuhn and Ibn Rushd shows that the path to renewal does not always rest on destruction, but on constructive criticism. Both remind us that true authority in science lies not in institutions or dogmas, but in openness to reason and the courage to question.

Thus, the synthesis of Kuhn and Ibn Rushd's thoughts can be a rich philosophical framework for the academic liberation movement and scientific reform. Kuhn teaches critical awareness of the established structure of science, while Ibn Rushd offers a normative basis for maintaining rationality as the core of intellectual activity. Both encourage the creation of a healthy academic climate, where freedom of thought goes hand in hand with high epistemic responsibility.



4. CONCLUSION

The discourse between Thomas Kuhn and Ibn Rushd in understanding the structure and dynamics of science presents a broad field of reflection for the contemporary academic world. Kuhn, with his historical-sociological approach to the development of science, shows that science does not grow in a vacuum, but in the context of a paradigm constructed by the scientific community. This paradigm is not neutral or universal, but contains elements of value and interest, which makes the development of science vulnerable to stagnation if not accompanied by the courage to criticize and overhaul the existing structure.

Meanwhile, Ibn Rushd with his steadfastness to rationality and logic provides a normative framework that balances freedom of thought with intellectual discipline. He not only calls for liberation from repressive theological authority, but also asserts that revelation and reason cannot be separated in the search for truth. By making philosophy a bridge between religion and science, Ibn Rushd makes a very important epistemological contribution in building an inclusive and rational scientific civilization.

From this comparison, it is clear that despite coming from different traditions and contexts, the two thinkers converge on one crucial point: that science is a dialectical field that must always be open to criticism, renewal, and rationality. Kuhn provides a dynamic framework for scientific change, while Ibn Rushd provides rational ethics in exercising freedom of thought. Therefore, the synthesis of their thoughts is very relevant to building a reflective academic climate, free from dogmatism, but still intellectually responsible.

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