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Qualitative Analysis of the Influence of Hadith Methodology on the Development of Ibn Haitsam's Scientific Methodology

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Abstract: This research reveals the influence of hadith methodology on the development of scientific methodology pioneered by Ibn Haitsam. The study aims to reveal the relationship between these two methodologies by analyzing through comparative studies, biographical studies and the works of Ibn Haitsam which are then analyzed qualitatively. This study reveals a fairly strong relationship between the Hadith methodology in verifying and checking the truth of the sanad with the scientific methodology of Ibn Haitsam. This study contributes to a deeper understanding of the relationship between the influence of Islamic science and the development of scientific methodology of science.

Keyword: Hadith Methodology, Ibn Haitsam, Development of Science, Scientific Methodology

INTRODUCTION

Both hadith and modern science are often considered to have very different or unrelated views. People often cite contradictions between the two sciences on several topics, which leads to some Muslim communities rejecting the role of both sciences [1]. However, both methodologies have some similarities, especially in the aim of both methods to obtain valid results from the object of study and the amount and rigor of effort required.

Modern science based on the scientific method, developed around the same time and place as the development of the hadith methodology. The scientific method of science, both experimental and observational, was first introduced by Ibn Haitham, who was born in 965 CE and grew up in Basra, Iraq [2]. His famous publication, Kitab Al-Manazir along with his other books translated into Latin, had a significant influence on many scientists in Europe before and even after the Renaissance period [3]. Some researchers consider Ibn Haitham as an important transition point in the development of modern science, from the methods of ancient Greek philosophy to the scientific method based on valid evidence and repeatable experiments. [4].

The Hadith methodology developed perfectly in 855-970 AD centered in Baghdad, Iraq with several famous Hadith scholars including Ahmad (d. 855 AD), Ali Al-Madini (d. 848 AD), Bukhari (d. 870 AD), Muslim (d. 875 AD), and many others. This hadith methodology was then collected comprehensively by Romahurmuzzy (d. 970 AD) in a book entitled Muhaddith Fashl Bainar Narrator wal Wa'i [5], [6] some time before Ibn Haitsam began developing his knowledge by studying several branches of religious knowledge.

However, the similarities and relationships between the Hadith methodology and the scientific method of science developed by Ibn Haitham have not been widely studied. This makes research on this topic an interesting approach and can contribute significantly to the early history of modern science.

METHOD

The study uses an analytical approach to obtain qualitative results on the importance of Hadith methodology on Ibn Haitsam's scientific method. Starting with a comparative study of the similarities and differences between the two methods, a study of Ibn Haitsam's biography, a descriptive study of his writings, and an interdisciplinary approach by citing comments from experts in Hadith and science.

This study uses primary and secondary data sources with strict inclusion and exclusion criteria. Primary sources include the writings of Ibn Haitsam, thus narrowing down to the following sources:

a. The Optics of Ibn al- Haytham , English translation of the book Al- Manazir Volume 1-3 Ibn Haitsam's work
b. T s the anger of Al- Hikmah a book in Arabic written by Ibn Haitsam which has been done tahqiq by Ammar Hours Ath-Thalibi
c. Ibn Al- Haitsam's on the Configuration of The World English translation of Ibn Haitsam's work entitled Maqalah fii Hayatil ' Nature .
d. Treatise on the Nature of the Marks on the Surface of the Moon English translation of Ibn Haitsam's work entitled Paper fil Atsar Az-Zahir fi Wajhil Qamar
e. The Celestial Kinematics of Ibn al- Haytham English translation of Ibn Haitsam's work entitled Maqalah fii The vowels Same '
f. Two main historical sources containing the biography of Ibn Haitham written in Arabic by Al- Qifti (d . 1153 AD) , namely the book Ikhbaarul ' Ulamaa ' bi Akhbaaril Hukamaa ' and Ibn u Abi Usaibi'a (d . 1270 AD) is a book ' Uyunul Anbaa ' fii Thabaqaatil Aththibaa'.

As for secondary sources, they focus on the Hadith Methodology and the history of its development, including Madkhal. ilal Hadith An- Nabawi , Taqrib The Greatest Hadith , Manahijul Baht books published by the Islamic University of Madinah, as well as books on hadith and Islamic history that have been widely accepted.

The research analysis is based on qualitative measurements of several parameters, including similarity, compatibility, and relationships, as follows:

a. Similarities in methodology
b. Time setting suitability
c. Suitability of the setting
d. Ibn Haitsam's relationship with the scholars of Hadith and their methods
e. Ibn Haitsam's relationship with the discipline of Hadith and its methods
f. Mention in the works of Ibn Haitsam about the Hadith Experts and their methodology

From the six parameters above, measurements were taken of how strong each parameter was and then a qualitative analysis was carried out using the table below:

Table 1. Qualitative analysis using similarity and fit parameters and relationship parameters

Qualitative Influence		Connection		
		Strong	**Enough**	**Weak**
Similarities And Compliance	**Strong**	Very Strong	Strong	Enough
	Enough	Strong	Enough	Weak
	Weak	Enough	Weak	Very Weak

RESULT AND DISCUSSION

Differences and Compatibility of Research Objects

The difference between the methodology of Hadith and the method of modern science lies in the object of research. The methodology of Hadith uses retrospective studies to comprehensively validate each chain of transmission until it reaches the source of the sanad. In contrast, modern science uses a prospective approach achieved through controlled experiments and observations. The main topics of Hadith are also usually different from those discussed in modern science, with little overlap that can still be compromised. This difference in objects and topics actually accommodates the compatibility of each discipline so that there are rarely any conflicts that are difficult to compromise.

Ibn Haitsam makes a clear distinction between the objects of science and Islamic sciences, with science focusing on objects that can be sensed in the universe either directly or with tools, while Islamic sciences are related to the supernatural or metaphysical which cannot be sensed, such as the attributes of God. [7]. Ibn Haitsam also warned students from speaking on topics outside their specialization unless they also specialize in those other topics. [8]. He emphasized that mathematics, logic, and reasoning are meant to help in understanding the findings in the objects of Science and not to contradict the results of observations or prioritize reason over the results of observations. In addition, he stated that the purpose of understanding Science is to know the perfection of God's attributes in His Knowledge, Action, Ability, and Wisdom [7], which is different from some atheist scientists today who deny the existence of God with various reasons.

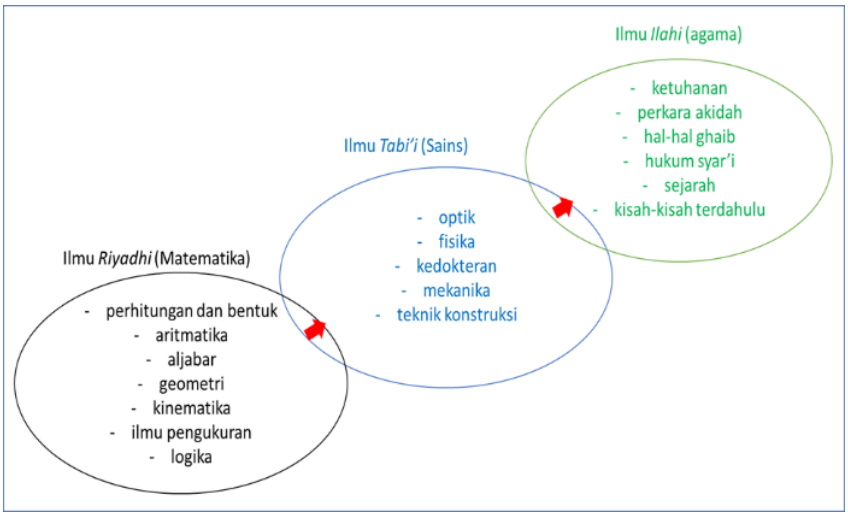

Figure 1. Classification of science based on book T sa angry Al- Hikmah by Ibn Haitsam

Equations Methodology Hadith And Method Scientific Science

Hadith science since more than a thousand years ago has used a scientific approach through several research steps. These steps include:

a. Data collection methods, including total sampling with inclusion and exclusion criteria, clarification, and validation.

b. Methods for assessing hadith narrators include testing, observation and expert assessment accompanied by classification or meta-analysis.
c. The method of analyzing the validity of the hadith, according to the strength of the reliability and accuracy of the narrators of the hadith, the continuity of the chain/sanad, the absence of hidden errors or weaknesses such as 'ilal (hidden errors), syadz (contradiction), idtirab (inconsistency), tadlis (concealment), and so on.
d. Principles and ethics, such as prudence, inductiveness, reliance on valid evidence and sources, honesty, hard work, and accountability [6], [9], [10].

Table 2. Similarities between Hadith Methodology and Science Methodology

Description	Methodology of Science	Hadith Methodology	Level Of Similarity
Data collection	Massive and repeated experiments and observations	Massive collection with testing and observation of the narrators of hadith and their hadiths.	Enough
Data analysis	Mostly quantitative analysis (of measurable variables), qualitative analysis (of unmeasurable variables), sometimes descriptive	Qualitative analysis (on the validity of the hadith), descriptive or meta-analysis (on the level of reliability of the narrators)	Enough
Conclusion	Inductive	Inductive	Strong
Error Checking	Standard deviation Analysis of various factors and confounding variables	- ' illal (hidden defects) - tadlis (concealment) - idtirab (hesitation) - syadz (contradiction)	Strong
Objectivity	objective prevent bias	al-' is (objective)	Strong
Principles and Ethics	- Be careful - based on evidence - truth - hard work - honesty - responsibility	- wara ' (caution) - based on evidence - truth and honesty - hard work - responsibility	Strong
Scientific publications and writing systematics	- introduction (background and objectives) - basic theory - method - results - analysis - Conclusion and Suggestions	- introduction (background and objectives) - methodology - contents / text of the book - sanad analysis - conclusion whether it is acceptable or not and the benefits	Strong

Review of the Biography and Works of Ibn Haitham

Ibn Haitham (965–1040 CE) was born in Basra, a city in modern Iraq, during the Abbasid Caliphate. He began his youth by studying various Islamic disciplines until he understood the differences in Fiqh and theology among the Muslim community (Al-Qifthi, 2005). According to his biography written by Ibn Abi Usaibi'ah (d. 1270 CE), he is known for writing several books and treatises that corrected and refuted the views of the Mu'tazilites, the Theologians, and the philosophers of his time on topics of metaphysics and natural sciences [11].

Some modern historians assess that Ibn Haitsam adhered to the Asy'ariyah faith because of his rebuttal to the Mu'tazilah. However, hadith scholars had much stronger opposition to the Mu'tazilites. At that time, Asy'ariyah was not fully established or dominant until the reign of Prime Minister Nizamul Mulk, who was born in 1018 AD, while Ibn Haitsam had moved to Egypt several decades earlier. [12]. A little before his lifetime, the Ahlul Hadith were still dominant and fierce in their opposition to the Mu'tazilah and were supported by the Abbasid

Caliphate with a number of well-known Ulama including Al-Barbahari (d. 941 AD). Scholars who were his contemporaries include Imam Ash-Shobuni (983–1057 AD) who wrote the book Aqidatus Salaf wa Ashabul Hadith, which contains agreement among hadith scholars on creed topics that are different from the current Asy'ariyah creed. [13].

Further study of his writings shows that Ibn Haitham was more inclined to follow the creed of the Ahlul Hadith than others. He believed in the dzatiyah and fi'iliyyah attributes of Allah, and that Allah is above and beyond the sky, and his scientific method combined rational and empirical approaches [7]. Although Ibn Haitham was inspired by Aristotle's books on natural sciences and Galen's works on medicine, he did not follow their thoughts in the field of metaphysics. In fact, he corrected them on various topics related to natural sciences and mathematics. This is in stark contrast to many Islamic thinkers of his time who tended to follow the entire thoughts of the Greek philosophers and even considered them as absolute truths that were more important or at least on par with revelation.

In his book Celestial Kinematics, Ibn Haitsam warned students of the science of handasah not to follow every word of the Greek philosophers and make them like Prophets who must be followed without needing evidence or reasons [8]. Ibn Haitsam's books that dared to correct and criticize the Greek philosophers were indeed controversial in their time and were refuted by other Islamic scholars, such as Abdul Lathif Al-Baghdadi (d. 1231 AD), who wrote a rebuttal to his work in order to defend some of Aristotle's concepts. [14].

Despite the popularity of his translated books in Europe for centuries, he was not well recognized among Muslim thinkers even after his era [4]. The only well-known Arabic book that cited his works was written by Kamaluddin Al- Farisi (1267-1320 AD), summarizing Ibn al- Haytham's Al- Manazhir, with additions that successfully explained the refraction of light and rainbow phenomena. This resonates with books written by European scientists inspired by the translation of Ibn al- Haytham's works [3]. His other book, translated as The Doubt of Ptolemy, was also a significant work that challenged Ptolemy's unrivaled geocentric model of the solar system and later influenced Copernicus's heliocentric model [3].

Since Hadith methodology was well-developed before Ibn al- Haytham developed his own scientific method, which was later followed by European scientists centuries later, there is a strong possibility that it influenced the development of Ibn al- Haytham's scientific method from the time background.

From a geographical perspective, Ibn al- Haytham was known to have moved from Basra to several cities, such as Baghdad, Shams, Egypt, and Andalusia, which means he may have met several Hadith scholars. In Basra, he might have met the students of Abu Dawud as -Sijistani, such as Abu Amr Ahmad bin Ali bin Hasan al- Basri, the transmitter of Sunan Abu Dawud, Muhammad bin Ahmad bin Ya'qub Al- Mutawasi al- Basri, the transmitter of the book Al- Qadr from Abu Dawud, and Muhammad bin Roja 'Al- Basri. In Baghdad, he might have met the famous scholar of Hadith, ad-Daruquthni (d. 996 AD), and his students, such as al-Hakim an- Naisaburi (d. 1014 AD), who wrote the famous book of Hadith Mustadrak ' alash Shahihain and Al- Madkhal ila ' ilmis Sahih , and Abu Nu'aim (d. 1038 AD) [13].

Ibn al- Haytham moved to Egypt in 992 AD and wrote his famous book there after being imprisoned for stopping the construction of the Nile River Dam due to its impossibility at that time. After being freed from the Fatimid Dynasty's imprisonment, he taught at Al-Azhar University and later traveled to Andalusia. In Andalusia, he might have met Abul Qasim Az-Zahrawi (Albucasis), the author of the famous medicine and surgery book At- Tasrif, and Ibn Abdil Bar, a well-known Maliki scholar of Hadith [13].

Relationship in Ibn al- Haytham's Writings

There were several relationships between Ibn al- Haytham and Scholars of Hadith that may contribute the significance of their influence on him such as below:

1) Ibn al- Haytham followed Scholars of Hadith's Theology in his affirmation of attributes of God. He said, “And ' Knowledge Divine which knowledge about Him who at outer of the skies, Al- Fa'il Al- Awwal , Mubdi-ul Mabadi ' , and Awwalul Awaa-il , He is Allah, The Highest and (knowledges) of His Deserving Attributes from Dzatiyyah and Fi'liyyah [7].
2) Ibn al- Haytham had several writings that from its title contain refutation to Mu'tazilah , Ahli Kalam, and some philosophers who indicate his position in theology similar to scholars of hadith as mentioned below:
   a. Ar-Radd ' alal Mu'tazilah fi ra'yihim al- Wa'iid
   b. Paper fii annad evidence ladzii yastadadillu aunt mutakallimu fi huduutsil ' alam argument faasid wal istidlaali ' alaa huduutsil ' aalam bill burhaanil the savior wal result true
   c. Treatise fii ar-Radd ' alal Mu'tazilah ra'yahum fii punishment the blessings of Allah tabaaraka wow ta'alaa
   d. Treatise on the bathlaani maa yaraahul mutakallimuuna min annallaaha lam yazal passion faa'il tsamma function
   e. Matter of reason for the sake of Allah Abi Haasyim Ra- iisil Mu'tazilah maa long time no see aunt ' alaa Javanese Bible sama ' wal ' aalami li aristhuuthaaliis
   f. Forgive me the answer is yes mas- alatin su-ila ' anhaa bad Mu'tazilat bill bashrah
   g. Paper fii Anna faa'ilu hadzal ' aalam inname Yu'lamu obey me fi'lihi
   h. Javanese gray Qouli li ba'dhil manthiqiyin fii ma'aani khaalafa thank you, min umuuril the thabi'iyyah
   i. Book fii itsbaatin prophecy wow iidhoohi phase ra'yilladzii yes'taqiduuna buthlaanihaa wow dhikrul al- farqa bainan prophet wal mutantabbi
   j. Ibanatul ghalath mimman make up for it may Allah grant him peace passion aa'il min fi'lin [15].
3) Ibn al- Haytham advised his readers to be critical of any non-revelations such sources and warned them from fanatically followed to any person except to the Prophets [8]. This confirms his method in religion is similar to scholars of Hadith.
4) Ibn al- Haytham borrowed various Arabic words that are usually used by scholars of hadith such as the words of As- habul Hadith, al-' Ilal and istinad on topics that's actually unrelated to hadith. He said, “…they followed the philosophers in every statement without questioning and persistence (rely) it to prove. Its only what to do As- habul Hadith to the Prophets peace upon them and not what to do students of mathematics to the philosophers [8]." He also said about the definition of Natural Science, " Ilm a th-Thabi'i is knowledge of objects that can be sensed, their properties, their illumination (causes), and their components' [7].
5) Ibn al- Haytham didn't use mathematics, logics, reasonings to deny or reinterpret the authority of revelations on the metaphysical objects and rather used it to help explain the natural phenomenon as the prove of God's perfection in knowledge, wisdom, and capability.

Experts Opinions of Interdisciplinary Thinking

To achieve an accurate approach, this research also cited the thoughts of experts from both disciplines on each other. In his book Al- Safadiyyah , Ibn Ta y miy y a refutes an Ash'ari opinion that living and non-living things do not have intrinsic attributes independently. He argued that the majority of Muslim communities accept the causes and the wisdom within them, all of which are created by God through His Will and Power [11]. Ibn Ta y miy y a also stated that there is no contradiction between valid reason and valid revelations and wrote the book Daar at- Ta'arudh bainal ' Aqli wan Naqli . This implies that there is no contradiction between valid results of scientific methods and revelations, such as valid hadiths [16].

This research also included direct interviews with modern science experts. Sutrisno, an expert in Electrical Engineering Science, stated that even the first revelation to the Prophet strongly recommended reading and seeking knowledge, including all kinds of beneficial knowledge such as natural sciences. Natural science phenomenon, known as aya h kauniyah, are from Allah, so there will be no contradiction between them and the aya h Syra'iyyah such as the Koran and Hadith. He added that the Hadith methodology is very strong, sturdy, and cautious, and modern science is similar to that but is still always developing. Ovide Decroly, an expert in Informatic Sciences, stated that in his opinion, the scholars of Hadith have developed their own unique scientific method based on empirical evidence, verification, and logic, but guided by revelations.

CONCLUSION

The study reveals significant similarities between Hadith methodology and the methods employed by Ibn al- Haytham in his scientific inquiries. Further analysis of his biography and writings suggests a strong relationship between Ibn al- Haytham and the scholars of Hadith. The significant similarities in methodology and the strong relationship indicate that Hadith methodology had a substantial influence on the development of systematic scientific methods, particularly in the works of Ibn al- Haytham. This research contributes to a deeper understanding of the interconnectedness between Islamic studies and the evolution of scientific methods.

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