Review Essay

The Role of Early Female Muslim Scholars in the Development of World Knowledge

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The world was introduced to the first academic establishment granting degrees when Fatima al-Fihriya, a female Muslim scholar, established Jamia al-Qarawiyyin, in the ancient city of Fes in 859 CE. After spreading throughout the Arab Muslim world, it took hundreds of years for this new establishment to make its way into Europe with the university of Bologna in 1088 CE in Italy. Despite the critical role played by female Muslim scholars in advancing knowledge, their contributions have been largely undermined. This is especially the case in the context of higher education in the Middle East and North Africa (MENA) region and within Moroccan universities. This paper reviews some key female Muslim scholars' contributions to the advancement of knowledge. Among these are Fatima al-Majritiya and Mariam al-Ijliya, experts in astronomy; Labana of Cordoba, an expert in mathematics; and Fatima al-Fihriya, who, in addition to establishing the first university in the world, was an expert in astronomy, theology, law, rhetoric, prose, and verse writing.

Keywords: *Intellectual History; female Muslim scholars; Knowledge Transmission; The History of Ideas*.

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INTRODUCTION

In a well-established hadith, the Prophet Mohammed (PBUH) stated that "seeking knowledge is mandatory on every Muslim," (narrated by Ibn Majah) encouraging all Muslims to actively pursue education, regardless of their gender (Yasin et al., 2023). As Pervez (2022, p. 213) notes, "There was lively participation of female companions and successors in the scholarly circles. Women, just like men, enthusiastically shared the knowledge they had heard from their Prophet (PBUH) with people flocking to them to listen and learn from them; some of the female students then became instructors themselves." This tradition of seeking and sharing knowledge highlights the essential contributions of women to Islamic scholarship. It serves as a reminder that female participation in education was highly encouraged and is deeply rooted in the teachings of Islam, where both men and women have been encouraged to learn, teach, and inspire others.

The concept of knowledge is deeply interconnected with the contributions of female Muslim scholars. Indeed, discussions about knowledge, its transmission, and the history of ideas would be incomplete without acknowledging their roles in educational institutions. This connection was notably highlighted by Fatima al-Fihriya's founding of Jamia al-Qarawiyyin in 859 CE, in the ancient city of Fes. Al-Qarawiyyin is regarded as the world's first institution of higher education, marking a seminal point in the introduction of organized universities globally. The historical narrative, however, often overlooks the vital contributions of female Muslim scholars and their contributions to world knowledge which span across various fields, including science, mathematics, astronomy, medicine, and even politics (Akhmedshina, 2023; Akhmetova, 2016; Al-Hassani, 2012; Gaida, 2016). Historically, many female Muslim scholars have often been overlooked or underrepresented in mainstream narratives. This literature review seeks to explore the extensive contributions of female Muslim scholars and highlights their impact on global intellectual traditions.

HISTORICAL OVERVIEW

The intellectual achievements of the Muslim communities expanded as they managed to build educational establishments in various places around the world; the world they ruled for decades. In fact, Thomas Erpenius deduced from Leo's[1] accounts that the Arabs from Fes to Kufa and Basra had more outstanding academies than the rest of the world combined in 1620 (Loop, 2013). Research on the matter shows that substantial financial

resources were invested in the endeavor of harvesting, sharing, and making knowledge by both rulers and citizens (Syed, 2019).

This development also resulted in significant interest in the study and translation of texts produced by Muslims in Arabic. In fact, as Bernard Lewis (1980, p. 41) states in his article *Translations from Arabic*, "Until the Renaissance and the Reformation . . . Arabic was probably the most widely translated language in the world, both in the number of books translated and in the number of languages into which these translations were made." The teaching, and learning, of the Arabic language was necessary for the transmission of Arab-Muslim knowledge to take place. This is better stated by the Arabist and University professor Thomas Erpenius, who was encouraged the learning of the language (Mills, 2017; Jones, 2020). As Erpenius put it on 5 November 1620, in his lecture on *The Value of The Arabic Language* to a new cohort of university students:

> Away with those who want discord among us and are trying with imaginary difficulties to put you off from the study of this most excellent language! I admit that, not so long ago, it presented difficulties for us here. But that was because the necessary means—the rules, the teachers, and the books—were missing, not because of their nature. But now I hope you will never lack them in abundant supply (Jones, 2020, p. 3).

Thomas Erpenius, advocated for the study of Arabic among his university students, and emphasized the intellectual importance of mastering the language.

METHODOLOGY

This research paper employs qualitative research design. It is an analysis of the literature on female Muslim scholars that have marked the history of ideas in the Muslim World and beyond. It is of the utmost importance to understand that this paper is a humble attempt to help build a narrative that highlights the primary areas of interests in which these female Muslim scholars functioned as well as their contributions to their areas of expertise.

This review focuses on literary works that highlight female Muslim scholars' contributions to the history of ideas. The primary strategy involved utilizing academic search engines, specifically Scopus, Google Scholar, and Web of Science, to identify relevant literature. Works were selected based on inclusion criteria written in English, related to female Muslim scholars in history, and published within the last twenty years, with one exception (Mernissi, 1993).[2] Selection also prioritized sources based on their academic credibility, relevance to the topic, and contributions to the understanding of female Muslim scholars' impact. A summary of the selected sample is presented in Table 1 below.

The texts used in this review are ten resources including books and articles. Each of these texts was carefully examined to identify references to female Muslim scholars and document their intellectual, academic, and scientific contributions.

Table 1. Description of the Sample

Text Title	Author(s)	Date	Language	Type	Citation
Forgotten Queens of Islam	Fatima Mernissi	1993	English	Book	529
1001 Inventions: The Enduring Legacy of Muslim Civilization	Salim T.S. Al-Hassani (Editor)	2012	English	Book	3
Arab Contributions to World Knowledge: A Contemporary Curriculum Imperative	Tami Craft Al-Hazza and Robert Lucking	2015	English	Article	2
Muslim Women and Science: The Search for the 'Missing' Actors	Margaret Gaida	2016	English	Article	2
Women in Islamic Civilization: Their Rights and Contributions	Elmira Akhmetova	2016	English	Article	6
The Role of Muslim Women in the Development of Science, Culture and Education in the Period of Early Islam	Fania Avzalovna Akhmedshina	2023	English	Article	1
Women and the Transmission of Religious Knowledge in Islam	Asmaa Sayeed	2013	English	Book	24
Muslim Women as Religious Scholars: A Historical Survey	Zainab Alwani	2013	English	Article	21
Women Scholars of Islam: They Must Bloom Again	Mohammad Omar Farooq	2003	English	Article	4
Contributions of Muslim Women in Science and Technology	Mohammad Ziauddin, Maryam Bibi, and Syed Shahabuddin	2020	English	Article	
Muslim Intellectual History: A Survey	Saulat Pervez	2022	English	Article	1

Table 1 gives a general overview of the text title, the author(s), the publication date, the language, and the citation rate. The review utilized content analysis to identify any reoccurring patterns and determine the domains that the female Muslim scholars have contributed to the most. Key areas of impact were identified in several areas of contributions, such as religious teachings and theology, education and academia, politics, and decision-making, as well as science and medicine.

The analysis suggests that there are thirty female Muslim scholars who notably shaped Muslim intellectual history, and they lived between the 7th and 15th centuries CE. Upon closer examination, it became clear that several female Muslim scholars were mentioned in multiple texts, resulting in some duplication, and indicating the significant impact they had on world knowledge to the extent that any discussion about female Muslim scholars without mentioning them would be incomplete. The scholars Fatima al-Fihriya, Lubna of Cordoba, and Sutayta al-Mahamali were among those most often mentioned, highlighting their prominent roles in historical narratives. Additionally, the analysis revealed that most texts tend to focus more on the roles that female Muslim scholars have played with regards to religious knowledge transmission.

Education and Academia

In the context of education and academia, numerous female Muslim scholars have played a significant role. However, Fatima al-Fihriya consistently emerges as a notable figure for she founded the University of al-Qarawiyyin in Fez, Morocco, in 245 AH / 859–60 CE. This institution is recognized by the Guinness Book of Records as the oldest continuously operating degree-granting university. Al-Hassani (2012, p. 18) states that "one generous-spirited woman called Fatima al-Fihri founded a university for her community in Fez, Morocco, using her own fortune. Al-Qarawiyyin today is known as the world's oldest university, continuing to grant degrees to students."

Fatima al-Fihriya played a pivotal role in the development of the holy site of al-Qarawiyyin, which is renowned worldwide as an old institute for knowledge acquisition and was established in 245 AH / 859 CE (Ziauddin et al., 2020; Pervez, 2022). This institution became a leading educational center. It attracted students of various faiths and produced notable scholars like Ibn Khaldun[3] (Tahiri, 2017). It was also the first institution to spark the interest of the Muslim World in organized higher education institutions, leading to the establishment of more than thirty famous academies

in the region (Loop, 2013). Consequently, al-Qarawiyyin flourished from its modest origins into a prominent hub for religious education and political discourse (Makdisi, 1981). Over time, it expanded its range of courses to encompass various disciplines, with a particular emphasis on the natural sciences. This remarkable evolution earned it the distinction of being recognized as one of the earliest universities.

Women engaged in both learning and teaching, and played a vital role in granting academic degrees, reflecting their recognized intellectual authority. Pervez (2022) explains that in Damascus, renowned female scholars including Fatima bint Abbas (d. 714 AH / 1315 CE), Sitt al-Wuzara (d. 716 AH / 1317 CE), Zaynab bint al-Kamal (d. 740 AH / 1340 CE), Aisha bint Muhammad (d. 816 AH / 1414 CE), and Bai Khatun (d. 864 AH/ 1460 CE) granted *ijaza*s to male scholars. Zaynab bint al-Kamal, for instance, reportedly gave an *ijaza* to Ibn Battuta, a renowned Moroccan scholar and traveler whose extensive journeys across the Islamic world and beyond in the 8th century AH (14th century CE) made him one of the most well-known explorers in history. An *ijaza* is a form of certification that Muslims used at the time to prove that one has the right to transmit authoritative religious knowledge, and it can be best translated as *license*. This form of certification is still part of today's educational system in some parts of the world in what is known as the LMD (License Master Doctorate) system, (Makdisi, 1981; Syed, 2019).

Women continued to participate in educational activities, primarily in the context of religious instruction rather than in the broader academic fields as understood today. Several female Muslim scholars highlighted that in the initial phases of Islam, women held a prominent role in education and contributed significantly to the development of some of the most accomplished scholars in the Islamic tradition. Aisha bint Abi Bakr (RAA),[4] the wife of the Prophet Muhammad (PBUH), significantly contributed to the understanding and dissemination of Islamic teachings. She provided extensive information about the life of Muhammad (PBUH), suggesting her role as an influential educator early Islamic history (Akhmetova, 2016; Alwani, 2013). Aisha (RAA) conveyed 2,210 hadiths, covering diverse topics such as inheritance, pilgrimage, and eschatology. She is recognized for her expertise in Islamic jurisprudence and her role in mentoring individuals across various age groups (Akhmedshina, 2023).

Both Alwani (2013) and Ziauddin et al. (2020) note that women played an important role in teaching both men and women in the early

Islamic period. Aisha bint Sad, for instance, was highly knowledgeable in the Islamic sciences, and prominent scholars like Imam Malik (d. 179 AH / 795 CE), Hakim ibn Utaybah,[5] and Ayyub al-Sakhtiyani (d. 131 AH / 748 CE) were among her students. Many early scholars, such as Imam Shafi'i (d. 204 AH / 820 CE), who studied with Sayyida Nafisa bint al-Hasan ibn Ali ibn Abi Talib (RAA), as well as Ibn Hajar, al-Sakhawi, and al-Suyuti, received *ijazas* from female scholars, and acknowledged the expertise of women in the field of Hadith (Akhmetova, 2016). Therefore, it is clear that early female Muslim scholars played a key role in the transmission of knowledge and the establishment of higher education institutions, leaving a lasting influence on our academic practices.

Religious Teachings and Theology

One of the primary motivations for many Muslim scholars in their pursuit of knowledge was to seek the pleasure of Allah (SWT). This spiritual drive guided both male and female scholars in their academic endeavors. As Pervez (2022, p. 224) notes, "For the most part, women's scholarship was focused on gaining expertise in Hadith, which they then taught to both male and female students." Ziauddin et al. (2020) also assert that women consistently demonstrated a strong commitment to acquiring knowledge, asserting their equal standing before Allah and their right to pursue intellectual goals. Aisha (RAA), the wife of the Prophet Muhammad (PBUH), played a significant role in documenting his sayings (Hadith), and became a respected expert in his teachings and earning great respect among the Prophet's companions. Female scholars like Aisha bint Abd al-Hadi (d. 816 AH / 1413 CE), a renowned Hadith expert who taught *Sahih al-Bukhari* in Damascus, were pivotal in preserving and transmitting Hadith, and prominent figures such as Ibn Hajar al-Asqalani sought her guidance (Akhmedshina, 2023). Karima bint Ahmad al-Marvaziya (d. 461 AH / 1069 CE), another leading authority on *Sahih al-Bukhari*, and Amrah bint Abd al-Rahman (RAA), a student of Aisha (RAA), surpassed some male scholars in influence and expertise. These women also made significant contributions to Islamic scholarship (Akhmedshina, 2023; Akhmetova, 2016). Thus, from the early days of Islam, female scholars played a crucial role in shaping the development of Islamic scholarship and the preservation of religious texts.

The tradition of female scholars continued through the following centuries. Umm al-Darda (RAA), a respected Hadith expert of the first

century AH, taught notable male traditionists, including Abu Bakr ibn Hazm, who was instructed by the Caliph to document her teachings (Farooq, 2003). Zaynab bint Sulayman (d. 142 AH / 759 CE) and Karima al-Marwaziyya (d. 463 AH / 1070 CE) were also recognized for their contributions, with many prominent scholars attending their lessons (Farooq, 2003). During the 5th century AH / 12th century CE, scholars like Fatima bint Muhammad and Shuhda (d. 574 AH / 1178 CE) "the Writer" earned titles that acknowledged their contributions to Hadith studies (Farooq, 2003). Hafsa bint Umar (RAA), daughter of the second Caliph, was entrusted with the handwritten copy of the Qur'an, signifying her importance in preserving the sacred text (Alwani, 2013). Farooq (2003) notes that female scholars had a profound impact on the preservation and transmission of Hadith, contributing significantly to the continuity of Islamic knowledge and cultural heritage.

Math and Astronomy

Early female Muslim scholars made notable contributions to mathematics and astronomy, often excelling in fields traditionally dominated by men (Al-Hazza & Lucking, 2015). Among these figures, Sutayta al-Mahamali, Labana of Cordoba, Mariam al-Ijliya, and Fatima Al-Majritiya stand out for their expertise. Sutayta al-Mahamali (d. 376 AH / 987 CE), born into a well-educated family in Baghdad, demonstrated exceptional mathematical skills, particularly in *al-jabr* (algebra), *hisab* (arithmetic) and *fara'idh* (successoral calculations), and invented solutions to equations which had long been cited by other mathematicians (Akhmetova 2016). She was recognized for devising solutions to complex problems that perplexed others (Ziauddin et al., 2020). Labana of Cordoba (d. 373 AH / 984 CE) was also a remarkable mathematician, specializing in intricate algebraic and geometric equations. Originally a slave of Spanish descent, she gained prominence in the Umayyad Palace of Cordoba for her mathematical prowess, earning acclaim across the region (Al-Hazza & Lucking, 2015).

In the field of astronomy, female scholars also left their mark. Mariam al-Ijliya, (fl. 4th century AH / 10th century CE) known as al-Astrolabiya, was recognized for her expertise in constructing astrolabes, essential for navigation and astronomy. She worked at the Aleppo Castle under the patronage of Saif al-Dawla,[6] producing groundbreaking designs that were highly sought after (Al-Hassani, 2012). Fatima al-Majritiya (fl. 4th century

AH / 10th century CE), another prominent figure in medieval astronomy, was well-regarded for her work in astrolabe construction alongside Mariam al-Ijliya (Al-Hazza & Lucking, 2015; Gaida, 2016). The significant achievements of these female scholars in mathematics and astronomy highlight the intellectual contributions of women in early Islamic history—contributions that remain under-recognized today.

Science and Medicine

Female Muslim scholars made significant contributions to medicine, defying prevailing gender norms. Rufaida al-Aslamiya (RAA), recognized as the first Muslim nurse, played a pioneering role by developing mobile medical units and leading a team of nurses to provide care during major Islamic battles such as Badr and Uhud. Her legacy endures, evidenced by the Rufaida al-Aslamiya Award presented annually at the University of Bahrain to an outstanding student. It is argued that Rufaida established the nursing profession over a millennium before Florence Nightingale, often considered the founder of modern nursing (Akhmedshina, 2023).

Another prominent figure was Al-Shifa bint Abdullah (RAA), known for her expertise in traditional medicine and literacy. She provided medical care, taught reading and writing in Medina, and was appointed by the Caliph Umar to oversee health and safety (Al-Hassani, 2012). Her nickname, "*al-Shifa*" (the healer), reflected her medical skills and contributions (Akhmetova, 2016; Ziauddin et al., 2020). Al-Shifa's role as both a healer and educator exemplify the multifaceted contributions of women in early Islamic society (Ziauddin et al., 2020). The contributions of Rufaida, Al-Shifa, and others highlight the pioneering involvement of female scholars in advancing healthcare and education during a formative period of Islamic history.

Leadership and Political Strategy

Female Muslim scholars played prominent roles beyond education and science, extending into politics and decision-making, beginning during the time of the Prophet Muhammad (PBUH). The Prophet appointed women to significant administrative positions, such as Samra bint Nuhaik al-Asadiyyah (RAA) and al-Shifa bint Abdullah (RAA), who served as a *muhtasiba* (market inspector), overseeing commerce and ensuring public welfare (Akhmetova, 2016). Al-Shifa, also a medical practitioner, continued in this role under the Caliph Umar ibn al-Khattab (RAA)[7] and was respected for her expertise and

ethical conduct. Moving to the Abbasid period, Zubayda bint Jafar, wife of Caliph Harun al-Rashid, contributed significantly to public welfare, including enhancing infrastructure along pilgrimage routes and constructing the Zubayda spring in Mecca to address water scarcity (Al-Rashid, 1980; Akhmetova, 2016).

Women's involvement in politics extended to ruling positions. Dhayfa Khatun (582–639 AH / 1186–1242 CE) governed Aleppo, establishing educational institutions that combined religious and contemporary teachings (Ziauddin et al., 2020). Fatima Mernissi (1993) highlights several female Muslim queens, including Asma bint Shihab al-Sulayhiyya and Arwa bint Ahmad al-Sulayhiyya, who ruled Yemen and were recognized as heads of state. Indeed, the *khutba* (sermon) was proclaimed in their names—a recognition granted to no other Arab woman afterward (Mernissi, 1993). Sultana Radiyya of Delhi, who came to power in 634 AH / 1236 CE, demonstrated significant leadership, maintaining social stability, and making contributions at the national level (Mernissi, 1993; Ziauddin et al., 2020). Sayyida al-Hurra (d. 959 AH / 1552 CE), a prominent Moroccan figure of Andalusian descent, also held considerable power. She governed Tetouan and led pirate forces in the western Mediterranean, later marrying the king of Morocco on her terms—an unprecedented event in Moroccan history (Mernissi, 1993).

These examples highlight the multifaceted contributions of female Muslim leaders who did not confine themselves to traditional roles. Their active involvement in governance, public welfare, and politics underscores their significant influence and challenges misconceptions of exclusion or oppression. Their contributions were integral to the social, political, and cultural development of their societies.

The Military and on the Battlefield

Female Muslim figures played notable roles in military activities, contributing significantly to areas traditionally dominated by men. Umm Ayman (RAA) served as a nurse and fighter, enhancing her reputation as a prominent traditionist (Sayeed 2013). Nusayba bint Kab (RAA) participated in several key raids and battles alongside the Prophet Muhammad (PBUH), including the battles of Uhud, Khaybar, Hunayn, and Yamama, as well as the significant events of al-Hudaybiyya (6 AH / 628 CE) and the first completed *umra* (7 AH / 628 CE). She protected the Prophet at Uhud and continued to fight despite losing her hand in combat at Yamama (Sayeed, 2013).

Another remarkable figure was Safiyya bint Abd al-Muttalib (RAA), the Prophet's paternal aunt, who passed away during Caliph Umar's rule (13–23 AH / 634–644 CE). She is remembered for her bravery at the battle of Uhud, where she confronted deserters with a spear in hand and remained composed upon witnessing the death of her brother, Hamza (RAA) (Sayeed, 2013). These examples reflect the active involvement of Muslim women in military campaigns during the early Islamic period. Their participation, whether as fighters or in supporting roles, underscores their dedication to expanding the reach of Islam and demonstrates their significant contributions to spreading its teachings and establishing the faith in new territories.

CONCLUSION

Recognizing the contributions of female Muslim scholars is crucial, particularly in today's higher education curricula. Despite their significant influence across diverse fields—such as education, science, medicine, astronomy, mathematics, politics, and even military endeavors—their legacies are often overlooked. This article highlights the foundational work of these scholars, whose advancements shaped their fields and influenced future generations. However, the challenge is not the scarcity of literature about these scholars, but its lack of integration into the education system. In an era where gender equality and diversity are increasingly emphasized in academic and professional settings, it is essential to incorporate the achievements of female Muslim scholars into curricula to ensure their work is recognized and celebrated. This research aims to address these historical inaccuracies by advocating for the inclusion of modules on female scholarly contributions across all departments, ultimately enriching students' understanding of their intellectual heritage.

This is particularly relevant today as the work of contemporary Muslim women scholars continues to shape global discourse. From education to political leadership, modern Muslim women are making profound contributions to various fields, building on the foundations laid by their predecessors. Recognizing their contributions in the curriculum not only honors the past, but also empowers future generations of women to pursue academic and professional paths. Consequently, further research into the lives and work of early and modern female Muslim scholars is essential to fully appreciate their ongoing impact on society and to inspire continued progress toward gender equality in academia and beyond.

Notes

1. Johannes Leo Africanus, his real name was al-Hasan Muhammad al-Wazzan al-Fasi, was a Moroccan diplomat and writer. He gained fame for his renowned work *Descrittione dell'Africa* (Description of Africa) published in 1526. This is the same account Erpenius referred to.

2. Fatema Mernissi's *The Forgotten Queens of Islam* provides a unique perspective on the role of women in Islamic leadership and politics. Her work contributes to a more inclusive historical narrative, integrating gender studies, political history, and Islamic scholarship, which aligns with contemporary efforts to diversify educational content and promote gender equity in academic curricula. It also is a Moroccan piece of writing which makes it a local addition to this paper. This justifies its presence despite defying the inclusion criteria this paper adheres to.

3. Ibn Khaldun (732 AH-808 AH / 1332 CE-1406 CE) was a prominent Arab scholar and historian, best known for his work *Muqaddimah*, which pioneered early theories in social science, including the rise and fall of civilizations and the effects of social and economic factors on societies.

4. The acronym *RAA* stands for *Radiya Allahu 'Anha*, which means "May Allah be pleased with her." This honorific is used to show respect and reverence for the female companions of the Prophet Muhammad (PBUH).

5. If the dates of life and death of an author are not included, as is the case here, then they are unknown.

6. Sayf al-Dawla (Ali ibn Abdallah ibn Hamdan, (303–356 AH / 916–967 CE), the Hamdanid ruler of Aleppo, known for his patronage of scholars and poets, including Mariam al-Ijliya. (See Marius Canard, "Hamdanids," in *The Encyclopaedia of Islam*, Second Edition, edited by B. Lewis, V. L. Ménage, Ch. Pellat, and J. Schacht, Vol. III: H–Iram (Leiden: E. J. Brill, 1971), 126–131.)

7. The acronym *RAA* stands for *Radiya Allahu Anh*, which means "May Allah be pleased with him." This honorific is used to show respect and reverence for the male companions of the Prophet Muhammad (PBUH).

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APPENDIX

Timeline of Female Muslim Scholars and their Contributions Across Centuries