

## Science, Education and Society in Contemporary Kerala

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### Abstract

*This paper locates itself within the contemporary debates on integrated science education in India, in the context of Kerala. The complex interface between science and society in the colonial and postcolonial period in Kerala is dealt here with special reference to the Mappila population. Employing the genealogical method it recounts certain distinct discursive moments precipitating their nature of the engagement between science and society. Kerala School of Mathematics and Astronomy during the pre-colonial period referred in this study has a contextual meaning from outside this debate.*

*During the postcolonial period in Kerala there were serious attempts to initiate a movement to promote science education, attributing it the quality of a transformative enterprise to rationalize society. In this socio-political scenario, among the Mappilas the new educational reformist group has started emphasizing the need for science education. This has seen the beginning of keenness for developing the same science spirit within the community along with others in Kerala. Adding to this, a recent trend in the last few decades was to spend long school years in Madrasa like higher education setup, which seem to offer a modern integrated curriculum, suggesting increase awareness in including science as part of new generation educational skills. The universal access within Kerala to professional and science education at higher education level along with the urge to recast their colonial image of educational backwardness, suiting to fit the modern requirements, is a matter now being discussed among them.*

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## Introduction

At present, after a long colonial hiatus there is a certain historical threshold towards substantive change for having science for higher education among the *Mappilas* of Kerala. Though, it has to be made clear on the very onset itself that this is not the observation as regards in their prospective change from the perspective of their social marginality. However, suggestively, the reverse situation to absorb the values of science has a new found forward look as visible in their changing educational scenario. However, from the perspective of higher education, it has been observed that things have not yet reached a situation of a complete social transformation in their level of educational mobility. Whether it calls for a focused analysis of their choice to opt for science courses as a new trend is therefore yet to be established. Rather, the recent trend systematically redraws the conditional fleeting attention paid towards science and a visible subjective and slow rupture is evident in some voices especially among the newly educated middle class. This seems to be indicative of a new mode of engagement with modern science. The social prejudice and the generally conceived religious orthodox view against modern education and science; as they have pre-determined idea of knowledge and inhibitions towards concentrating on scientifically constructed courses for imparting basic and technical education etc; is however not lined in the same discursive track, at least in today's parlance.

Having said that, the present research is laid out within the existing discourses on development vis a vis backwardness in the context of Kerala. It therefore reviews certain outcomes with reference to the impact of long term developmental interventions at grassroots level and socio-reformist initiatives at diverse stages that have brought about current changes in the attitude of new generation Mappila youth's raising their interest in science education. This issue has been engaged with utmost sincerity. With taking into consideration the development debate from the perspective science education in Kerala, it can be retrospectively relate with the participation of different section of society in the public sphere of Kerala. The early period of science regression from colonial anticipated confrontation was overcome by people's science movement fronted by *Shastra Sahitya Parishad* (KSSP 1984), which has developed the regional sense to reclaim the power dynamics in science field acted out towards a counter hegemony. As has been rendered in the science debates on its relevance as viewed in a secular atmosphere (Kannan 1990), science is a matter of clarity of perception, a matter of internal accumulation and integration of experiencing natural facts. This basic training in

science is necessary for a closer acquaintance with critical integration of all knowledges taught at school level as well as for preparing students to handle multiple truths.

Connecting to this science debate in Kerala there was also a resurgence of its lost anchoring within ancient science history of Kerala. In the different phases of science history that has appeared on and off in Kerala society this spirit of search could be traced back and it has already left open indigenous markers preserving the significant role of science; supposedly rebuilding an old vitalist materialist natural science. This view reflects the need felt in every culture for upholding knowledge and its true spirit manifested in scientific temper. This is proper to refer new modern Kerala science education. However, at one level there have been considerable ongoing differences still locally driven on modernity and at the other level the orthodox Mappila negation of social reality of the role and presence of science in social perspectives and outlook on understanding and solving social problems governed their educational quest. Having said that, scientific and progressive approach to knowledge for social development has had nevertheless developed a sensible means in Kerala society towards adopting a rational solutions to social issues. With the advent of the spread of science education towards the end of the last century it has provided the real cultural incentive towards schooling arguably as a mode of modernization of values.

Hence, there already existed an active realm of debates which sensitize the Mappila community at various contexts referring the significance of present relevance of science for contemporary education. In changed socio-economic milieu in Kerala there is the new environment for this renewed interface of science, education and development debate especially among Mappila community. Based on this premise we can consider their duality of science and society. Selected referential sites have been analyzed with regard to this context as main coordinates to invoke the history of educational backwardness of Mappilas. It analyses the nature of science debates which picture them to have overcome traditional obscurantism, which is a debate in relation to Indian Muslims in India (Habib 2008).

Learning science for critical thinking is part of the growing debates concerning the nature of newer or 'coming society' (Agamben 1993). Therefore, any society without little science orientation is meant to address technologically transformed world system applicable even among the most orthodox sections. In my observation, the truth question involved in the colonial production of a western pattern of subject formation in an eastern self through modern education has remained among Mappilas as the central question for long, but is now receiving a new orientation. The current purpose attributed to science education as a new

requisite suggests a social consciousness to pragmatically reorient the colonially constructed subjectivity (Banu 2014). It seems to have achieved the mode of redressing colonial appropriations of subjectivity through the apparatus of colonial governmentality (Banu 2014; Pels 1999). The colonial and post-independent development debates hardly addressed this backwardness in science fields.

Historically also there were compound facets which were actively involved in their religiously destabilized and internally disorganized individual state, until the later nationalist period (Ansari 2005). Colonial policy of education has indirectly continued to affect their attitude to modern education as well as western sciences. However, recently, an alternative line of self critical reflectivity and adoption of modern values of science inculcated in them a new approach to modernity. This has been taken shape after a long time of reclusive socially compressed state of ‘typification’ as belonging to backward communities and state appraisal of educational problems of Muslims in Kerala. This flips in their thinking is highlighted in this development discussions.

## I

To set the ground for their quest for science education we invoke here the larger science history in Kerala. This section narrates the complex interface between science and society in the pre colonial to colonial period. The genealogical method (Foucault, 1977) is employed to recounts this. There are certain discursive moments that have precipitated the Mappila engagement with scientific enquiry. Also the Kerala School of Mathematic and Astronomy during the pre-colonial period is referred having contextual meaning with reference to this study.

It is observed here also that the traditional quest for science within the context of east and its contributions has escaped the mental landscape of western historiography. Therefore, the west was only trying to enact and to have narrated the science context in India without any true knowledge of it or any sincere attempt to know our early contributors in science (Kumar, 1999); as it was designed mainly for promulgation of colonial cultural and science hegemony (Pannikar 1995). In their demonstrative site of presenting the quality of western critical rationality, the Kerala society remained in darkness, with understated value science knowledge. The colonial claim has become part of our perception of science life.

In a plural society like ours, the thread of social connection, which is realized in essential form through interfusing the active segments of varied faith, as part its universal

fold, is mainly embodied however through its intrinsic culture, which has a product of exemplarity; which seems to have codified the ethical outcomes and a new added meaning of coexistence. A lesser known fact is knowledge was seen as a semantic force integrating the power of culture in the pre-colonial period. Kerala is no exception in this regard. For instance, the Kerala School of Astronomy and Mathematics has not seem to be known to have existed in any colonel reference and now is officially unified and recognized even in west as one of the early contributors to science world whom the Europe has conveniently ignored (Joseph 2009). Kerala has not been known for these achievements. The Kerala School of Astronomy and Mathematics has existed and has had a life of its own from the fourteenth century to sixteenth century, actively integrating various thought.

The pre-colonial Mappila involvement in science in the context of Kerala is not the area I have at hand, but to go into this particular phase in medieval history would mean that we have reached the knowledge debate which hitherto had no place. The historians of science have thrown very little light upon this cultural complexity and wider horizon within which Kerala culture has developed and accepted new knowledge systems.

Among Mappilas through the myth of the origin of Islam in Kerala, we here try to retrieve the knowledge transmission during this period among Mappila as what remains is only the story of the conversion of a Chera King to Islam. Perhaps with the spread of Islam in Kerala the astronomical reading of the cosmology continued among Mappials. It might have the attraction of the Chera King when the Muslim missionaries got in touch with the King in Kerala to begin a communication. As is known famously, many civilizations including Islam has encountered ancient Greek Astronomy and Philosophy. Similar interface has happened in different parts of the world alternatively but history has failed to document such sharing and dissemination of knowledge. The interface between Islamic and Hindu astronomy is not the main topic however here. The period of Islam is certainly not the golden age of pre-democratic science and also during medieval period Indian science is lesser known. This could be official means to engage with science history till recently.

The transmission of medieval knowledge, especially Astronomy, Science and Mathematics from India to Europe is now a serious area of research. For instance, Joseph (2009) notes, that the Kerala School of Astronomy and Mathematics have already, by this period, had developed ‘infinite series’ and ‘calculus.’ And astrology is part and parcel of Kerala home as seeing planetary movements is important even now in all families for all occasions. The Malayalis have not recognized that they are following an old science which

lost its real meaning. The medieval period in Kerala is a time which is not properly engaged though. The story of the myth of the origin of Islam in Kerala is therefore not only the story of a King but the state of knowledge during this period.

In Kerala, the mathematical school flourished to such an extent, but could have lost its importance during this time. Conjecturally, so when the pilgrims who were travelling, as traders and religious scholars from the eastern countries came into the presence and company of the powerful Chera King, what matters influenced him. Their influence would not have been in the form of their cultural appropriation of Kerala astronomy, but to introduce a new way of narrating astronomy to the Perumal (the King). This might have generated in him a serious interest in the rich experiences of religious life their country. The prophet from Mecca whose followers were allowed witnessing the rare galactic rearrangement in the form of the splitting of the moon is popular myth of Mappilas which is connected to the Kings travel to visit Mecca. The folk description goes in many directions and the most potent is that he went to see this rare sight from Mecca himself. The historical narrations do not absorb the rarity of this event and its rationality. This lack of acknowledgement is the hidden truth which is unconsciously being told and preserved through this much contested myth. Among historians there are very few who completely accept this myth as the story counters scientific evidences recorded in Kerala history during this period.

Not so famous is the story among the Mappilas that he also said to have consulted his astronomers before going to Mecca. But this whole issue of knowledge is somewhere dominated with religious fervor. Another story states that he heard from a traveler or an Islamic scholar narrating the story of the split of the moon during or after the time period of the prophet and he went with them and changed his religion and came with a new idea of religion and dies in the return journey by sea. The main text of this myth of origin of Islam in India missed this logical corollary of the knowledge migration initiated during medieval period in the coast of Mediterranean and Arabian Sea. It is the irony of history that there is no trace of discussion on the matter of how a culture which has already acquainted with calculus, temple cosmology and planetary science might have taken this new narration. Therefore, I am not considering of revisiting the Mappila history. The goal here is to interpret the reason for the rapid on and of shifting of the language and its meaning of not gaining overtly for integrated science education.

Islamic knowledge dissemination in Kerala in the later medieval period is known through the arrival of the Makhdum family; a group of scholars who came from Yemen to Kerala. They

provided not only intellectual and political leadership, but became close to the native Kings. Through them Ponnani, the then port city and Military capital of native kings, has become the center of scholarship and activities in south India. Among these scholars it is the name of Zainudeen Ibn Ali bin Ahmad Mabari (1467-1522 A. D.) whose name is the most well documented (Logan 2000; Makhdum 1583). He is known among the natives popularly as the First Makhdum. It is under his guardianship that they laid the foundation for an institutionalized system of learning in Malabar. Not before starting his leadership he travelled from Malabar to gain more education to al-Azhar, Cairo, Egypt and came back after completing five years of education. After his return he built the *Valeya Jumma Masjid* (The Great Juma Mosque) in A.D 1501 at Ponnani which had over time developed into a center of Islamic learning and came to be called the al-Azhar of Kerala Muslims.

William Logan has though very little to say about their contribution which he added in *Malabar Manual*, a recorded history of the Mappilas during colonial period. It records that the average daily attendance there of students was around 400 including from foreign countries like Indonesia, Malaya and Java, spending many years for the finishing and also gaining titles for becoming the ‘lamp of wisdom’ (Logan 2000). He has not explored the vastness of the institutional system though he suggested that the syllabus was very broad. It was designed to comprehensively cover knowledge fields, including *Quran*, *Hadith*, and *Fiqh* as well as Arabic language, literature, Grammar, Rhetoric, Geometry, Astronomy, Arithmetic, Logic, Philosophy, Medicine, History and Mysticism.

Knowledge of such vast area could not be handled by someone in one institution who does not have an approach of ‘integrated science education.’ There was no separation of religion and science. Not to mention that it was during this period that Malabar found its place in the educational map of Islamic studies in Asia. It also earned the title of *All Ilmu Ponnani*-the hub of knowledge and wisdom. The economic and cultural prosperity of the people of the Malabar Coast and increasing living standards of Muslim traders during the later medieval period was also reflected in the functioning of the institution in such a humongous level. During this period, it could afford to bring popular Islamic scholars from the Far East and other countries. The nature and method of integrating science and religion was however not known to us. In *Taufathul Mujahideen*, Zainudeen notes that Quasi and Mulla in major religious centers of Malabar were appointed sometimes by the government and received their payment from the government treasury (Makhdum 1583, 1963).

There is new trend to sporadically return back to certain fine properties of their own traditional learning practices which once parted with them. It was a far more inclusive education in the standard of medieval knowledge practice as it includes a broad unified curriculum combining religion, history, science, geometry etc as compared to the later orthodox notion of imparting only religious education. Currently, the conscious realization of the need to rebuild social conditions has brought light upon certain facets already institutionalized in the traditional learning practices.

## II

This section is to engage with the current discourses on integrated science education among Mappilas. As it seems to have finally set the stage for exploring the hitherto openly hidden indigenous sources of integrated science education, the tradition of accepting knowledge in all fields, which was once part of the Kerala is explored further.

The Makhdum's literary, cultural frame is visible in their popular Arabic poems and other genres of literature with which they integrated Islam to local wisdom. The exegetical writings of first and second, in the line of successors, of the Makhdum family, found place, in the libraries of the Middle East and Saudi Arabia, and got included in the library of al-Azar University (Mohamed 1985). The literature was an important means of learning but the same tradition intermittently lacked the view of the larger perspective to come to terms with the interconnection of knowledge. Exploration extended to all possible fields of human cultivation and subscription of the method of yielding to carry forward the messages.

Moreover, the level which they have achieved over the centuries of scholarship and erudition has been symbolized by their eagerness to engage in serious intellectual pursuits of the description of political and social ecosystem of their times. Of particular importance are Zainudeen Makhdum's *Taufatul Mujahideen*, a history book, written in the language of Arabic in 1584 (Mohamed 1985). The book has acquired much significance in our times as an important historical document which renders a lucid account of the social and political history of Kerala during the fifteenth and sixteenth centuries. It also provides a lucid sociological account on caste system and various customs prevalent during those periods. Most importantly, it has offered an objective account of European colonialism and the maritime war, especially that of the Portuguese period. Many translations of the book in various languages, including English and Portuguese have come up as signs of its distinctness.

A detailed historical account of the political situation in Malabar during the Portuguese aggression in the Arabian Sea from 1498-1583 is observed covering the larger picture, and its effect in areas of focus on the social, political and economic activity, and the passing, and the lifeline, of the people, creating channels and pockets outlined. It was during the period of Sheikh Zainudeen Makdhum Second (1524-1583) that the Zamorian of Malabar faces the most detrimental retaliations from the Portuguese Army. The book meticulously describes the coming of the Portuguese army, and attempts to invade, Malabar and the tireless resistance, encoded by the Zamorian's army by his right hands. The Zamorian in order to stabilize his internal position, in the regions, sought by sea, the help of Muslim leaders, situated on the West Coast, to curtailing the powers of the all, Portuguese Army.

As they grow as the center of power among the Malabari Muslims, the Makhdhums of Ponnani interests expanded to political matters as well. They have played the diplomatic role in favor of the native rulers from time to time as sometime translators and sometimes as their main diplomatic messenger to the Muslim rulers. They had been maintaining friendly relations with rulers in Saudi Arabia, Egypt, Turkey, Bijapur, Gujarat etc. Sheikh Zainudeen Makdhum Second, who was also the political advisor to Zamuthri Raja, was the interlocutor between the Arabs traders and Zamuthri Raja, and facilitated the latter to maintain a strategic relationship with the Arabs and the Mughal rulers in relation to marine business and taxes. The book is dedicated to the then Deccan ruler by way of convincing him of the historical inevitability to wage a war against Portuguese invasion on the Malabar Coasts and the need to help the Zamuthri raja.

But during the later Portuguese period economic condition of people of Malabar particularly of Muslims gradually deteriorated. The continuing war with the Portuguese affected the economic prospects of the Muslim Merchants; who liberally sponsored huge sums to the Dars. The financial support given by the native rulers might have also withered away gradually. In the final analysis these factors inversely affected the functioning of Dars and these institutions thereon registered a very low profile of existence. The decline of Muslim indigenous education system which had begun during the Portuguese period was brought to completion during later British colonial period with the low profile existence registered by the Makhdum family during this time.

Integrated scholarship enforced by the *Makhdhums* is an advancement and achievement which are not interpreted from the perspective of integrated science education. The *Makhdum* second was also a historian and is aligned and counted among mainstream

historians in Kerala. To point that they were not only institutionally engaged in the delivery of the process and purpose of knowing the mechanisms involved in teaching and learning but has not separated historiography. Particularly, I am here referring to Zainudeen Makhdam and his literary dedication entitled *Taufathul Mujahideen*, a valuable document on the history of Medieval Kerala. Their sense of historiography was acclaimed among contemporary historians especially for its method of rendering facts. Seemingly, they have gained this authenticity from books they borrowed from Middle Eastern libraries. It resembles and seems to draw insights from Ibn Kaldhun's *Mukhadima* a treatise on historiography. The significance they devoted to the social and cultural history, ethics and astronomy could be in the contemporary parlance be termed as 'integrative science approach' to knowledge.

### III

Another intense phase in the integration of science to education started in the post-colonial period in the 1930's when a group of leaders who realized the need to bring back their lost confidence and therefore started on self correction. The scientific techniques were unheard until it becomes vital. To talk of women, to promote a new internal journey, formal education was provided by this reformist group with messages drawn from diverse sources close to their own hidden history. Social movements have been observed in order to identify the high and low impact of the oral traditions continued in society. They took up the issue of female girls and women's education as part of their agenda of mobility, to go towards addressing, as a limb, of the whole problem and encouraged even parent and relatives to be conscious of the need to address the problems they consider as part of their commitment to religion. They upheld that faith had already conferred equal rights to both male and female, to gain knowledge of any kind and therefore the problems have to be identified as a misinterpretation of their own achievements. They continued a long line of alternate tradition drawn by such like Makti Tangal (1847-1912); whose contribution made a mark for many who have come to follow this path, which was the beginning of the educational rethinking; had already showed to them how they openly promoted science and mathematics among both boys and girls (Kareem, 1997).

Unlike the religious orthodoxy, this group who tried hard to convince and separate themselves from known fractions, and claim to have adopted a local variant of certain ideals of Wahhabism called Mujahids. By following the examples of those encouraging people, they engage themselves and become part of the scientific endeavor in Kerala. As a result of the

new commitments many men and women joined the reform movement especially in the region called Areakode. It is an area which is marked as the main focus of their activities. Many women got inspired by their husbands to learn mathematics and science. These were the fields of knowledge which were known to have conventionally dominated by the male themselves (Banu, Shareena, 2014). Among the large number of early educated women took to teaching as a profession and went to different districts of Kerala as science or mathematics teachers. This is of particular sociological importance as the mobility is a matter to be further explored in relation to their economic independence.

This achievement has its larger implication when we look at the participation of women in science. “Women in science” have been an issue among feminists who raised the issue of lack of representation of women in the field of science. Feminists such as Haraway (2001) and Harding (1991) claim that the modern science has been able to construct a masculine model of interpretative method and institutionalized practices. The achievement made by the Mappila women in Areakode shows that with the supportive social movement and reinterpretation of the science there could have positive results in science field irrespective of gender. The status of Mappila woman as mathematics teacher or physics professor changed the stereotypical image of women as being ‘emotional’ and not being able to engage in objective science. Their achievement shows that knowledge is not gendered and with sheer commitment and concrete support women can excel in any field.

At this point a brief discussion about the reformist’s outlook to science is necessary here with reference to the history of western science. They give special attention to science literacy or science education among the people through various science magazines. Some of the leaders paid special attention to astronomy and astrophysics. By becoming science teachers as well as religious scholars, they broke the dualism between science and religion. They spent time to convince the people about the importance of scientificity and raised the value of science among people and taught people about the relevance of science. They encouraged people, irrespective of gender, to relate their everyday life with modern science. They encouraged the Muslim community to take equal interest in science education and the modern technical profession and enter in all technical professions. Mathematics and physics, both basic and applied are and were historically important areas of study for the Muslims. This revived interest in science literacy as part of the education campaign has enabled a section of the community to open up to all forms of scientific knowledge.

#### IV

Not seen from the conventional reading on the question of Mappila identity an integrated science approach to education has affirmed their place along with the others who were already adopting an integrated science approach such as the Ezhavas, Nairs and Christians of Kerala. Mappilas are now entering the field of science education. In the history of Mappila education, the practice of integrated education was something though familiar to them from the medieval period, there continues to be a lack of awareness of their own history of integrated science approach. However, only recently the contemporary focus has been shifted to integrating subjects like history, languages, sociology, and philosophy. For Instance, the institute Darul Huda in Kerala, started in 1986, now engages in integrating sciences calling it as a new practice named as ‘unity of knowledge.’ There is contemporarily no limit-lock put in this institutions notion of knowledge. In the twelve year compulsory syllabus the students are pursuing science and technology, mathematics and computers and social sciences and English. This refers to the sporadic return to certain fine properties of their own traditional learning practices which had once parted with them as mentioned earlier.

Another instance is the increasing interest in the not so popular engineering and medicine. There are 8% mandatory reservation for Muslim students below cream layer now as per Socially and Educationally Backward Classes (SEBC) scheme by the Government of Kerala in all professional courses such as Medical, Fisheries, Veterinary, Agriculture, Engineering and Architecture in all institutions both government and private.<sup>1</sup> Alongside, there are 22 Muslim minority engineering colleges this day under Muslim management in Kerala.<sup>2</sup>

However, even today, professionalism and confidence in the field of contemporary integrated science is still not achieved, because of confusion because of the lack of self perception and historical invisibility marked out and irrecoverably transposed. Lagging behind in promoting oneself and the lack of access to skill and professional learning is the main reason. The government support system will have to be then gradually given a new orientation. Articulating about the lack of professional training has become the concern which has been addressed in the last few years. There is yet the need to learn more on how to handle the situation and put pressure to address the issue of applying for more positions so that the earlier group of learners gives the opportunity equally to the new generation to come forward and express their problems in addressing the issues especially in professional training.

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<sup>1</sup> [www.cee-kerala.gov.in](http://www.cee-kerala.gov.in)

<sup>2</sup> <http://engineersworldonline.com/muslim-management-engineering-colleges-in-kerala.html>

Academic activities are now on the basis of professionalism and this realization is coming from inside. The approach is upside down now and eyes are only on the left out silence on science.

### Conclusion

The main idea which is being made in this study is that the Muslims of Kerala have already had a history of integrated science education. Among other things, this has allowed them to now look back and see their own history differently. Setting it from the frame of the integrated science approach enabled us to see the nature of the swirl that has happened for centuries in Mappila education in a different light. A recent addition to Mappila quest to answer the process of coming out of the colonial impressions of an educationally backward community unknowingly returned them back to their originally designed and institutionalized all-encompassing curriculum. Their original contributions are not yet highlighted, but are now inspiring many to engage in advanced science and technology course and to engage in the art of the field. Many are not only confined to these, but explore their skills and creative potentialities in as diverse fields of activity as painting, photography, Film and T. V. Serial direction course, graphics and animation, acting, script writing, etc. Sliding away to not so familiar areas and then deemed as backward as if the culture is a static entity is nothing but a falsely assumed self assumption, which is slowly passing.

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