

The Role of Muhammadiyah Higher Education Institutions in Science and Technology

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INTRODUCTION

The role of Higher Education Institutions (HEIs) in national development more specifically in the development of its science and technology is the subject much of discussion in Indonesia. Attention and interest in the role of HEIs in the national development has increased. Indonesia's unquestionable success at expanding basic education is a significant achievement. However, without better access to good higher education, those advancements will have a limited long-term impact on creating opportunities for young Indonesians. Recently, the organizational structure of the school system was separated into two streams: the Islamic stream under the Ministry of Religious Affairs (public and private), and the secular stream under the Ministry of National Education (public and private) (Wicaksono & Friawan, 2011). Further Wicaksono and Friawan (2011) explain that based on their status, the HEIs in Indonesia can be divided into two groups: the public HEIs and the private HEIs. The public or state higher education institutions run by respective government on the other hand the private institutions run by the organization or foundation. Admission into a public university is very competitive, with only 20 percent of students taking the entrance exam being accepted in some years. Private institutions and some public ones administer their own admission tests rather than the standard admission test. Tuition at a public school is low but varies between institutions. In comparison, tuition fees at a private university can be quite high. It is thought, with the education reforms, the cost of public universities is likely to rise in the future.

The public HEIs are under the jurisdiction of the state treasury law, education system law and civil servant law and are treated as part of the ministry. Private HEIs are regulated under the Foundation and Education System Law, and are considered the business arm of the foundation or organization. Based on the latest law of National Education System 2003, there are 5 forms of Indonesian higher education system: Academies (Provides only one particular applied science, engineering, or art), Polytechnics (Provides applied/practical specific skills), Advanced schools (Provides academy's or professional education in one specific knowledge), Institutes (Consists of many faculties/departments on one knowledge discipline), Universities (Offers training and research in various disciplines).

Muhammadiyah as the second largest Islamic organization in Indonesia with 29 million members has devoted itself to social and educational activities. Muhammadiyah is the largest modern Muslim organization in Indonesia, founded by Ahmad Dahlan in Yogyakarta in 1912. Historical evidence appears to show that Dahlan wanted to reform within the Muslim community, to prevent it from becoming more traditional in outlook. He looked for 'progressive' solutions to future religious questions. The proposed solution was the introduction of a modernization process within the Muslim communities to prevent them from becoming remnants of the past, traditional society. Since the beginning of establishment, Muhammadiyah has placed education as one of the media to achieve the goals of this organization. Education held by Muhammadiyah is one of the forms and types of Charitable Effort of "Persyarikatan", the formal institutional structure, tiered from the primary level to college. As for the shape, type, and level of Muhammadiyah education was in essence a manifestation mission of Muhammadiyah development especially in the field of education, which is substantially related to Islamic education which is based on the Quran and Sunnah in the understanding of the religion as a Muhammadi-well, and the well-being is connected to the basic ideas of KH Ahmad Dahlan in pioneering and

Muhammadiyah education building.

The prioritizing of Muhammadiyah program approach in education was found as a very strategic instrumental approach, not only in promoting the education during the Dutch colonial era, but also for preparing broad-minded future leaders of Indonesia. The first and second President of Indonesia, Sukarno and Suharto were educated in Muhammadiyah schools. The founder of the Indonesian Army, Grand General Sudirman was formerly a Muhammadiyah Boy Scout leader. The 1998 reform movement leader in Indonesia, Prof. Dr. Amien Rais, was former Chairman of National Board of Muhammadiyah. Nowadays, most of Muhammadiyah alumni and leaders are the front liners in promoting democratization and multiculturalism in Indonesia (Markus, 2007).

The role played by Muhammadiyah in education improvement is indispensable in the context of the development of intellectual life of the nation. This is indicated by the number of Muhammadiyah schools spread throughout Indonesia. It has been mentioned above that in 2010, the data shows that Muhammadiyah has 9500 education institutions starting from kindergarten till university, in particular 2,289 pre-schools, 2,604 primary schools, secondary schools consist of 1,722 junior secondary schools (both regular schools and islamic school, and 1,023 senior secondary school (regular, vocational schools, Islamic school, and boarding school), and seventy-one schools for persons with disability. It also has one 162 universities and colleges (two-year, three-year, or four-year colleges) (Muhammadiyah, 2010)

Muhammadiyah Higher Education Institutions

As one of the leading Muslim organizations in the country of Indonesia, Muhammadiyah began to play a crucial role in society in the beginning of the 20th century. Muhammadiyah has power in the sector of education and human resources development, science, and exploration of Islamic aspects of life and they give alternative advancement and excellence in national or regional level. In education sector, Muhammadiyah has 178 education institutions from kindergarten to higher education level. Muhammadiyah through its HEIs help alleviate the responsibility of the Indonesian government in order to educate the nation. Muhammadiyah HEIs (MHEIs) educate the children of the nation to prepare for a better future and equip them not only with knowledge, skills and expertise, but also the values of Islam. Thousands of alumni of MHEIs spread in a wide variety of jobs, ranging from civil servants, educators, private sector employees, entrepreneurs, bureaucrats and politicians.

Currently, MHEIs continues grow dynamically. MHEIs hold the spirit of Al Islam and Kemuhammadiyahan as the basis to enlighten humankind. MHEIs become the first choice for many high schools graduates. With approximately 178 higher educations, the dynamics of education in Muhammadiyah is inevitably. MHEIs spread all over Indonesia. The dynamic existences and roles of Muhammadiyah institutions in education has made Muhammadiyah becomes important partner for the Indonesian government in deciding national policy, including education policy. MHEIs support each other for the sake of improving the quality of education. However, this situation becomes challenges as well for Muhammadiyah leaders that they should develop MHEIs continually, particularly in lines with the changing paradigm. The leaders of MHEIs need to formulate new paradigm in leading educational which synergizing the intellectual development, professionalism in accordance with the need of economy market without losing traditional values of Islam. (Said, Muhammad & Elangkovan, 2014)

How MHEIs play significant roles in the development of science?

Higher education institutions bear a profound, moral responsibility to increase the awareness, knowledge, skills, and values needed to create a just and sustainable future. Higher education plays a critical but often overlooked role in making this vision a reality (Cortese, 2003). Due to its contribution to the development of science and technology, MHEIs has developed typical curriculum to achieve the goal of its education purposes which comprise of these following values:

1) Develop optimal potential learners and their interaction with the demands and needs of the environment, without losing sight of the values and traditions that are rooted in the community and are still relevant to be preserved.

2) Grow-developed moral values (morality) in the context of the development of science and technology and social change.

3) Develop creative learners.

4) Enrich treasures of human culture, and

5) Prepare students to have life skills and be able to face the challenges and dare to live up to his time imbued with the spirit of Islam.

MHEIs understand that to play the pivotal roles in the development of science and technology, they have to formulate some strategic plans and actions to gain the intended goals.

a. Training new generations of scientists

One of the strategic actions that continuously and sustainably conducted to prepare and produce scientists or scholarly scholars is trainings. The trainings are intended to revitalize and reform key universities and upgrade to world-class research universities, promote culture of excellence in education, provide fast track training to best students, reduce brain drain, establish research units and centers of excellence within university, departments and faculties to reinforce links between education and research, build local, regional, and international capacity to address critical issues, and participate in global forum to identify recent advances in ICTs

b. Contributing to problem-solving research

With approximately 178 HEIs, MHEIs with their high quality researchers and scholars have been taking part as the problem solvers for the current problems in science, technology, economic, and social problems. However, as private education founder, Muhammadiyah has put more efforts on how to secure adequate and sustained funding mechanism to support quality education, research and innovation and to attract, train and retain best and brightest young researchers though some programs such as scholarships for Muhammadiyah young leaders, grants for researchers, regional undergraduate fellowships and exchange programs for scholars.

In addition, Muhammadiyah Organization is always on the high spirit to establish autonomous, self-governing national and regional research foundations. With some business units run under the umbrella of Muhammadiyah organization, MHEIs have the funding sources which can be managed and spent to develop research centers. As dynamic and visionary education institutions, MHEIs are challenged to always update and do the curriculum reforms and ICT-based innovative teaching methods to produce problem-solving scientists, technologists and innovators.

c. Developing closer partnership with academies of science

Knight 1993 (in Qiang 2003: 249) describes internationalization of higher education as 'the process of integrating an international/intercultural dimension into the teaching, research and service functions of the institution'. The internationalization process would be effectively established when there is partnership or cooperation with home institutions and overseas institution. Regarding the importance of developing partnership, MHEIs always develop collaboration between competent research teams within universities to address critical regional problems and also make links between universities and research institutions within government ministries. In addition, make links between university research units are also considered an effective policy and strategy to improve the networking as well as to give opportunities for the scholars to improve their skills and knowledge in conducting and producing high quality research results. I would like to highlight the important point that the networking among MHEIs has been well established. Once an institution collaborates with one MHEI, it would be possible for this institution to collaborate with other MHEIs. Several joint activities have been initiated and implemented in order to improve the quality of academic and research works. The MHEIs develop

cooperation as a strategy to improve the quality of education and science since it is believed that partnership opens opportunities for innovative strategic projects, access to alternative funding programs and enhanced capacity.

In relation to international partnership, MHEIs have been very active in initiating partnerships with many institutions overseas. For example, University of Muhammadiyah Purwokerto, the university where the writer is teaching, has been very active in establishing and managing collaborations with institutions abroad, such as from France, New Zealand, Japan, South Korea, Bulgaria, Australia, Malaysia, and Thailand. This partnership eventually open opportunities for the academic staffs to do some scholarly activities such as joint research, joint meetings, joint seminars, double degree programs and many other related activities. One of the example of the research related to the development of science and technology conducted in collaboration with CIRAD, France was the breeding and planting of "Kopyor" coconut. This type of coconut has a very high economic value since the price is very high in the market. The high price is caused by the limited number of production since it is considered hard and time consuming to plant this type of coconut. However, through a rigorous research, currently this type of coconut could be planted with short waiting harvest time and the tree also produces more coconuts before. The joint research with CIRAD, France has made this research contributed more values and knowledge to many disciplines such as biology, agronomy, economics, agribusiness and not impossible for the discipline of pharmacy and medicine.

CONCLUSION

In conclusion, this paper was trying to present a small part of the big picture of Muhammadiyah Higher Education Institutions roles in the development of science and technology especially in Indonesia. The contribution of MHEIs to the education in Indonesia is inevitable. The national and global community has been witnessing the MHEIs effort to have been providing access to high quality education which comprises of knowledge of science and technology and Islamic values. As a commitment to educate the young generation to be scholars, MHEIs are also offering scholarships and other social services to students to attract and motivate qualified students to enroll to higher education institutions.

Besides, to support the government program in the development of science and technology, MHEIs committed to conducting training and research, development, implementation and monitoring of policies and reforms. In addition, carrying out high-level research activities also becomes the priority work in developing science and technology. Networking is becoming the focus of internationalization to become the active member of global society which can contribute to the science and technology development for the prosperity of mankind.

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