

# Human Resource Development And It Issues In The Field Of Science And Technology In Malaysia

Khadijah Ismail, Mohd Hafiz Safiai, Ezad Azraai Jamsari

**Abstract** :This article discusses human resource development in Malaysia in the field of science and technology, focusing on the science of astronomy. Parallel with today's world development, science and technology has a huge impact on society. Moreover, the emergence of Industrial Revolution 4.0 is indeed viewed as very significant in this field. Society assumes that with the emergence of this revolution, opportunities for employment will decline as most jobs would be performed by machines. Hence, this research examines the human resource development issues in science and technology in Malaysia. This research is qualitative in design with a case study approach using document analysis, interview and observation methods. Research results find that there are some issues involving human resource development in the aspects of management and administration. It is hoped that discussions such as this can help government efforts in resolving issues of human resource development in the field of science and technology in Malaysia.

**Index Terms:** astrofiqh, cosmofiqh, human resource, Islamic astronomy, observatory, science and technology, telescope

## 1. INTRODUCTION

Today's modern and sophisticated technology causes significant changes in aspects of development of human resource skills and expertise. Science and technology has greatly facilitated humans to manage jobs. However, humans need also to have the knowledge and skills in managing and using technology. For example, installing a telescope at an observatory is not an easy matter, more so operating a telescope, and its maintenance really needs specialized knowledge and skills. Hence, it is very necessary for workers to be trained and highly skilled for the purpose of carrying out maintenance. For that reason, proper human resource development needs to be utilized to ensure an agency is operating well. This effort is important because it related to the management of people such as compensation and benefits, recruiting and hiring employees, onboarding employees, performance management, training, organization development and culture. Hence, this research examines the human resource development issue in science and technology and efforts in solving the problems.

## 2 LITERATURE REVIEW

In Malaysia, astronomy is still lagging behind compared to advanced countries. This is seen in the ratio of professional astronomers (who possess at least a MSc) to the Malaysian population, which is 1: 2.8 million inhabitants in comparison to, for example, the ratio in United States of America is 1: 50,000 inhabitants [1]. According to Naicker & Govender [2], a study by The Global Astronomy Survey (GAS) conducted under the project,

Developing Astronomy Globally (DAG) Cornerstone, in developing countries, identified the weaknesses and strengths of science and technology development in certain developing countries. Even though Malaysia was not involved in the survey, from the analysis done by GAS, it was deduced that Malaysia is still at the second level of the survey, namely, of countries with their own astronomical research and with a social group which understands astronomy but nevertheless requires support in various aspects such as education and national development policy to advance in astronomy. In Malaysia, development of astronomical research may be measured by the increased research conducted by undergraduate and postgraduate students in astronomy [3, 4]. Although universities in Malaysia are not as yet fully offering exclusive astronomy programs, there is increasing awareness toward making astronomy a program and subject at university and school levels, especially among policy makers. In addition, some related studies for reference are 'Observatories in Malaysia, Descendants of Islamic Civilization Superiority' by Ibrahim et al. [5], 'Functions of Astrofiqh Observatories in Malaysia in Solving Astrofiqh Issues' by Ibrahim [6], 'Malaysian Observatories and Those of the Islamic Civilization Era' by Safiai [7], and 'Islamic Astronomy & the Establishment of Al-Khwarizmi Complex in Malaysia' by Ibrahim [8]. The development of Islamic astronomy program and subject at universities in Malaysia has produced graduates with theoretical and practical knowledge of falak or astronomy. Even so, according to Ismail [9], in a market study of graduates of an Islamic astronomy program at Universiti Malaya, these graduates still do not have the opportunity to apply their skills learnt at the appropriate place or institution with specific national astronomy-based agenda. This is due to the worker recruitment system which must generally go through the Malaysian Public Services Commission or in some states, the job position is within the jurisdiction of the State Government Secretariat and State Religious Council and only given to persons born in the respective state. The majority of respondents stated that graduates of this program are suitable for employment in an organization with an Islamic astronomy background, observatory management and Shariah administration. However, the problem stated has an effect somewhat and causes a big loss of human resource needed

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by the relevant agency nationwide.

### 3 METHODOLOGY

This article focuses on human resource development in the field of science and technology in Malaysia. This qualitative study was conducted using instruments of document analysis. Data were obtained from authoritative sources such as journal articles, seminar papers, conference proceedings, colloquia, books, government and non-governmental reports of information related to human resource. In addition, data and information were also sourced from relevant agencies such as National Space Agency (Malaysia) and Mufti's Department from each state. Development of human resource sources were referenced to understand the issue of this field. The data obtained were examined and analyzed using a thematic approach. In addition, a number of informants were selected to obtain information directly from figures involved in human resource development in the said field. In order to strengthen the value of this research, interviews were made at few places, such as National Planetarium, observatories, and astronomy complex. This is to ensure the data obtained in the research are genuine to be used in the analysis process.

### 4 RESULT ANALYSIS

#### 4.1 Human Resource Development in Malaysia

According to Collins Cobuild Advanced Dictionary [10], development is the process of developing something or increasing and growing to something better, and in The Oxford English Dictionary [11], besides the process of developing, development is defined as a new product or idea and activity of forming a new level in a changing situation. In Kamus Dewan Bahasa dan Pustaka [12], development is about developing, process of developing (achieving progress, growth, advancement) and effort or activity to develop (advance and develop). According to Abdul Ghani [13], development in Islam or Arabic language is al-tanmiyyah, which means to increase and grow. It implies a long-term result while 'training' is more a short-term result. In books and past journal studies, especially in Western studies, the term 'training' is frequently paired with human resource development research. In Islamic human resource development by Islamic figures, the terms for education in Arabic, namely al-ta'lim, al-tarbiyyah and al-ta'dib, are frequently explained in the context of human development. The said terms are repeatedly stated in the books of Imam al-Ghazali and Imam Hasan al-Banna as well as books on education to develop humans. Hence, the terms, training, education, al-ta'lim, al-tarbiyyah and al-ta'dib are explained first to gain a clear understanding of human resource development in this context. The term training is lesson or instruction to master and familiarize with instructions received and training means the process of learning skills needed for a job or activity. According to Gautam [14] education means instruction, training and teaching including the process of developing human capability and behaviour. In this matter, Benomran [15] held the opinion that education from the Islamic perspective is the process of training the mind, body and individual's morals so as to be a useful person in this world and the hereafter, while Langgulgung [16] added that education is the process of developing the human potential. The three Arabic words mentioned above synonymous with

education, namely, al-ta'lim, al-tarbiyyah and al-ta'dib. Al-Ta'lim as stated in al-Qur'an in surah al-Baqarah, verse 31, means teaching, which has a narrower meaning than education. Al-Tarbiyyah as stated in al-Qur'an in surah al-Isra', verse 24, means to raise, nurture, educate and grow. And al-ta'dib is more accurate as its meaning is not just to teach, but is close to the concept of knowledge in Islam including educational content. Al-Ta'dib is a process of cultivating, internalizing and practising manners and morals in the self. Thus, al-ta'dib is a process to merge knowledge, theory and practice including disciplining morals and spirituality, acquiring mental intelligence, proper implementing of something and preventing one from making mistakes and doing bad. These given definitions show that education and training are important interrelated concepts included in human resource development terminology. There are various definitions of human resource development and its concepts are presented in human resource development journals and textbooks, training and human resource management books. Generally, through a literature review of four main human resource development journals, books and articles about human resource development, there is no consensus in discussing the definition of human resource development. Traditionally, it is defined in terms of the individual, work process and organization, focusing on training, education and development. Then this terminology developed with research by human resource development institutions and academies in America, India and Korea, namely, a definition which connects training, organizational development and career development to improve achievement. In the latest human resource development research, its definition increasingly grew in line with research in many countries through incorporating bigger concepts in discussions of human resource development, namely religion, transorganizational development, various areas and countries and everything related to humanity [17]. Malaysian academicians also discuss various definitions of human resource development. Human resource development or training and worker development is defined by Yusof [18] as a continuous effort to improve worker skills and focus attention on aspects relating to work environment for the common benefit of workers and organization. Makhbul and Hasun [19] differentiated between the definitions of training and development, namely training is whatever initiative taken by the organization to encourage workers to learn and increase their knowledge, whereas training is more focused on acquiring knowledge for the short-term and the process of educating new workers on the basic skills necessary to do their tasks. In contrast, development means efforts by the organization to widen knowledge, skills and ability of workers for the long-term. While Cascio [20] defined training as programs designed to increase the performance of individuals, groups and organizational levels. Increased performance may be measured by changes in knowledge, skills, attitude and social behavior. For Islamic scholars and intellectuals, the term human development or human resource development is much related to Islamic education terminology. The main purpose of education and development in Islam is to shape humans with faith in Allah SWT and to earn Allah's pleasure [21, 22]. According to Baba [23], Islamic tradition in education frequently relates education to developing human potential. This differs from the Western view that education only relates to the process of transferring information, skills and experience of the teacher to the pupil or from lecturer to

student. He added that nourishing spiritual, intellectual and physical quality in a balanced manner is an approach very compatible with the human nurturing process. Hence, in the context of this research, the terminology human resource development is very closely related to education and developing of human potential. Hasan al-Banna was one of the prominent Islamic educators who trained and produced many many missionary cadres in the Ikhawanul Muslimin movement until al-Qardawi held that the movement since its inception had developed an Exemplary Madrasah for Islamic education which was really successful. Islamic education, according to the understanding of Ikhawanul Muslimin founded by al-Banna had special imperative characteristics, namely, the concept of divinity, perfect and complete, harmony and balance, creative and constructive, creative and constructive, brotherhood and loyalty, and possess identity and independence [24]. For that reason, one of the objectives in education outlined by al-Banna [25] is to create opportunities for success in life by loving Islam and holding on strongly to Islamic morals, different from teaching to love the world (materialism) and influenced by Western culture. Through teaching faith in Allah SWT or concept of divinity, then obedience to Him as well as preoccupation in pursuit of a lofty ambition will transcend small desires for the temporal, with the hope for victory in the hereafter, as well as constant repentance and putting trust in Allah SWT in all endeavours. Islamic education and development is perfect and complete education for the heart and mind, spiritual and physical, morals and skills, because Islam prepares humans to be good in easy or difficult circumstances, during peace or war times, and prepares society for all good and bad, sweet or bitter [26]. Human resource is an organization's essential asset as humans play a vital role in determining continuity, developmental growth as well as continued success. In Islam, humans or people need to play two roles, namely as Allah's slaves and vicegerent on the earth. Allah SWT created humans as the best of creation and acknowledges humans as al-Khalifa (vicegerent) on earth. Humans as vicegerents, means to master, rule and manage. This means that al-Khalifa, humans are given the mandate by Allah SWT to manage all resources found on this earth. The principles of al-Khalifa and al-falah (success) requires to be cultivated in training and human resource development because among the purposes for living is to be Allah's slave and al-Khalifa. Vicegerency means replacing God in His role of administering the earth al-Falah means success in this world and the hereafter. Since this vicegerency concept is internalized in human nature, Allah SWT created humans to manage all the treasures and other creations found on land, in the sea and air. The task of managing the earth assigned by Allah SWT, when understood in-depth, is a responsibility, namely a trust which must be shouldered by the human community, in which for every task, humans are accountable to Allah SWT in the hereafter [27]. Hence, the concepts of vicegerency and success are very close and relate to humans as it involves a heavy responsibility and trust in developing humans to be al-Khalifa. In conclusion, in this context, human resource development is education, efforts and programs arranged by an organization to increase worker's faith, skills and productivity in order to improve the quality of human resource or workers in the organization so as to contribute to the success of organizational goals, specifically, and the greater goal of the individual's success in this world and the hereafter.

#### **4.2 Issues on Human Resource Development in the Field of Science and Technology**

In this sub-topic, the researcher only gives an introduction to training and human resource development in Malaysia that is related to the field of science and technology, namely involving the Public Services Department (JPA), MESTECC and State Government Secretariat. The history of training in Malaysia began before independence. Since the years 1920s and 1930s, prospective officers, especially at district level, were given services training at Kuala Kangsar Malay College (MCKK). After Malaya achieved independence, training opportunity was opened wider when officers of the Malay Administrative Service (M.A.S) were given the chance to enter the Malayan Civil Service (M.C.S). Emphasis on training at that time was more focused on fulfilling political needs rather than management needs. Training strategy became more organized when the Administration Development Unit at the Prime Minister's Department issued a study report on the need for manpower in the year 1969 which proposed setting up a really development-oriented institution to provide management training to officers at all levels of administration in all government agencies. As a result, Institut Tadbiran Awam Negara (INTAN, the National Institute of Public Administration) was established in September 1972 to play the role as an effective training institute in management and administration for national development [28]. The core of human resource development in Malaysia emphasizes increased supply of science and technology manpower in line with rapid development of knowledge in new science and technology [29]. Implementation of the Training Policy of Public Sector Service Human Resource for federal civil service officers laid out the training policy and objectives of human resource training. Among the objectives are; that every member of the public service requires to equip himself with an appropriate attitude, skills and knowledge through planned human resource programs based on developing competency and continuous learning [30]. This is in line with principles of human resource development theory from the Islamic and Western perspectives which emphasize organizational change from inside out, learning process to acquire knowledge and training to increase skills. The reward system is the Human Resource Management System (PSM), involving the Cabinet Committee 1976, New Remuneration System (SSB) and Malaysian Remuneration System (SSM) as one of the efforts to improve the system [31]. In order to prepare efficient and responsive civil servants, at the end of the year 2002, competency-based practice of the PSM began to be implemented in the public sector under the Malaysian Remuneration System (SSM). Competency-based SSM in PSM practice in the public sector involves six aspects, namely, selection and appointment, training and development, career development, performance management, succession planning and granting reward or remuneration [32]. In human resource development theory from the Islamic and Western perspectives, good environment and reward system for the worker are also emphasized. Thus, the human resource management system implemented under the Malaysian Remuneration System (SSM) is a good one. Consistent with the strategy of prioritizing science and technology development, the government announced in April 1986, the National Policy of Science and Technology. The National Policy of Science and Technology (S&T) is for the purpose of

encouraging the use of science and technology as a tool to develop the economy, improve the human physical and spiritual well-being of people and protect national sovereignty, which form part of the national socio-economic development. Among the plans for developing science and technology capability is development of the national capacity of S&T resources such as energy, technical and scientific research institutions, higher learning institutions and others toward developing indigenous technology capability [33]. Hence, looking at the policy, its implementation needs to be seen as providing good human resource in science and technology, particularly at observatories nationwide. Training and development are not just the employer's responsibility toward workers in an organization, it is also one of the main agenda for the Ministry of Human Resource Development. Through the establishment of Pembangunan Sumber Manusia Berhad (PSMB, the Human Resource Development Berhad), the government has provided a certain amount of funds for the purpose of training and human resource development in Malaysia. The government's serious commitment in providing a fund for human resource development should be the source of strength for observatories in Malaysia, which are under the government sector, to obtain good training for their workers from the training fund provided. Human resource development at observatories nation-wide is very closely linked and needs to be concomitant with the implementation of the vision, mission and objectives of the public sector's human resource development in Malaysia because the National and State observatories are under the public sector. Generally, human resource development is under Jabatan Perkhidmatan Awam (JPA, the Public Services Department) and the respective State governments and are presented first in order to understand the agency involved because the human resource of official observatories in Malaysia are under their jurisdiction. JPA is the government administrative body in Malaysia which manages the human resource of public services. Among its objectives are rationalization of the size of public services through structured and systematic human resource planning by making projections of comprehensive human resource needs, providing public services with service schemes and organizational structure, which is relevant, flexible and fulfills current needs in order to enable the organization to implement the functions of its establishment. In addition, the objectives of the JPA is to produce and develop the best human capital, competent to meet the strategic needs of the Public Services and nation through training policy and dynamic sponsorship program as well as to manage public servants and develop the human resource policy through the formulation and implementation of a strategic and effective public services policy. However, interviews with observatory managers and workers show arising issues such as the bureaucracy and difficulty of adding and training workers besides the government's provision of certain funds in each department. Nevertheless, JPA is willing to add human resource if there is a strong reason given in a working paper to apply for additional human resource, and financial strength at the level of the JPA [34]. If the JPA is willing to consider any proposal to add job positions and funds for staffing through a process of consideration in the Organizational Development Section of JPA. After JPA's approval, the Ministry of Finance will issue a warrant of employment and proceed to gazette it in the Malaysian Public Services Commission. As the observatories are under the trusteeship of the State Mufti

Departments and the main objective is rukyah (moonsighting), human resource development under the State Government needs to be examined first. Human resource development in the States is the responsibility of the Human Resource Management Section of every State Government. Every State has its own human resource objective and for every observatory under the supervision of the Islamic Astronomy Unit at the State Mufti Department, the staffing system is under the jurisdiction of the State Government Secretariat [35]. Competent and suitable human resource is very essential in operating an observatory. Human resource is the determining factor for success or failure for an observatory, especially skilled and trained staff. The history of observatory development in Malaysia, other than private and school observatories, come under the jurisdiction of three organizations, namely, MYSA (or ANGKASA) at MESTECC, for the Langkawi National Observatory and Planetarium Observatory, State Mufti Departments for State observatories and the university for university observatories. An observatory requires at least two permanent observers, an engineer to operate and maintain the telescope and a technician to watch over the overall observatory [36]. An observatory of the Islamic golden age had its own director, treasurer, clerk, library and other administrative officers apart from in-house scientists. Through interview and document collection methods, it is submitted that there are different forms of staffing and institutions which oversee workers and staff at observatories in Malaysia, namely those with science and sharia background under MESTECC, Jabatan Kemajuan Islam Malaysia (JAKIM, Department of Islamic Development Malaysia) and also the State Mufti Department. In observatories under the authority of States and universities, human resource is under the supervision of State Governments and State Religious Councils and the Falak Unit of the respective states. Training and human resource development of observatory workers is implemented under the supervision of the Falak Unit of the State Mufti Department and organized by JAKIM and falak certified by Universiti Sultan Zainal Abidin (UniSZA), as well as by State observatory initiatives to give particular training to observatory workers. Some of the courses offered by Institut Latihan Islam Malaysia (ILIM, the Islamic Training Institute of Malaysia) under JAKIM are about solah (prayers), qibla direction of Mecca, rubu' mujayyab (sine quadrant), takwim (calendar) and workshops on using telescope for observation. In addition, the research section under JAKIM also organizes astrophotography workshops and invites astronomy experts to share knowledge and train workers, including observatory workers, at the Islamic Astronomy Unit of the State Mufti [37]. This shows concern on the part of JAKIM and the State Mufti Departments by providing proper training for observatory workers compatible with human resource development principles which emphasize transfer of knowledge, training and skills to workers in an organization. Further, most observatory workers attend the Falak Certificate program under the Falak Unit of UniSZA. This program is one of the efforts by UniSZA to train manpower able to handle problems related to falak application. Among the courses of the Falak Certificate program are Takwim Istilahi (Calendar Terminology) and Direction of Qibla, Instrument and Practicum, Takwim Solah (Calendar for Prayer Times), Physical Astronomy and Rukyah (Moonsighting) Skills. Staff under State Governments are obliged to attend courses seven times for seven days in a year under the initiative of the head of department. Thus, it is

the duty of every head of the Falak Unit at the State Mufti Department to schedule particular training sessions for staff under him [38].

## 5 CONCLUSION

The seriousness and initiative of various parties, namely the governments, individuals and universities in developing training programs for workers and the society generally show a deep interest and commitment which fulfills the principles of human resource development theory that emphasize the importance of a good environment and system in developing human resource in the field of science and technology. This matter should be the focus of government's attention and coverage in efforts to improve the quality of advancement in science and technology in Malaysia.

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