

Challenges and Learning Strategies of Islamic Education in Islamic Boarding Schools in the Industrial Revolution Era 4.0

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Abstract

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Along with fast technological advancements, Islamic education problems in Islamic boarding schools are becoming increasingly diversified. They must adapt to technological and digital advancements dubbed the industrial revolution 4.0. When it comes to the fast growth of information technology, the public will constantly question Pesantren's negotiating stance. As a result, it may be appropriate for Islamic boarding schools to loosen their regulations regarding the use of devices or gadgets while maintaining rigorous controls over technology to execute the learning process in the Islamic boarding school setting. This study seeks to ascertain how Islamic boarding schools address the difficulties of the 4.0 revolution period through their educational techniques. This study employs a qualitative approach through the use of a literature review. The findings indicate that Islamic education in pesantren has a substantial impact on educating and moulding the morals of pupils who adhere to the Qur'an and Sunnah. Nonetheless, the needs of the industrial revolution 4.0 era have compelled pesantren to open and develop into institutions as suppliers of Islamic education. Modern Islamic education may address current issues while maintaining the religious principles that define education in the pesantren. This study employs three Islamic teaching principles in Islamic boarding schools: disruptive mentality, self-driving, and reshaping or creation.

Abstrak

Kata kunci:

Pembelajaran;

Pesantren;

Revolusi Industri 4.0;

Pendidikan Islam

Seiring dengan kemajuan teknologi yang pesat, permasalahan yang dihadapi pendidikan Islam di pondok pesantren menjadi semakin beragam. Pendidikan di pondok pesantren harus beradaptasi dengan kemajuan teknologi dan digital yang dijuluki revolusi industri 4.0. Di tengah pesatnya perkembangan teknologi informasi, sikap negosiasi Pesantren akan terus dipertanyakan oleh publik. Oleh karena itu, sudah sepantasnya bagi pondok pesantren untuk melonggarkan peraturan tentang penggunaan perangkat atau gadget dengan tetap mempertahankan kontrol yang ketat atas penggunaan teknologi dalam pelaksanaan proses pembelajaran di lingkungan pondok pesantren. Penelitian ini berupaya untuk memastikan bagaimana pesantren menyikapi kesulitan masa revolusi 4.0 melalui teknik pendidikannya. Penelitian ini menggunakan pendekatan kualitatif melalui studi pustaka. Temuan survei menunjukkan bahwa pendidikan Islam di pesantren memiliki dampak yang cukup besar dalam mendidik dan membentuk akhlak anak didik yang taat kepada Al-Qur'an dan Sunnah. Meskipun demikian, kebutuhan era revolusi industri 4.0 telah memaksa pesantren untuk membuka dan berkembang menjadi lembaga sebagai salah satu pemasok pendidikan Islam. Pendidikan Islam modern dapat mengatasi masalah

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saat ini dengan tetap mempertahankan prinsip-prinsip agama yang mendefinisikan pendidikan di pesantren. Ada tiga prinsip ajaran Islam di pesantren: mentalitas yang mengganggu, mengemudi sendiri, dan membentuk kembali atau mencipta.

INTRODUCTION

The Industrial Era 4.0 is a phrase that refers to an era in which technology is merged so that the physical, biological, and digital aspects become indistinguishable (Schwab, 2017). For instance, two individuals can communicate information immediately with one other using digital help without physically or biologically being in the same location or at the same time. The digitization of data and the widespread use of artificial intelligence (AI) are in numerous human life spheres (Lase, 2019). In this volume of the Industrial Revolution, fewer and fewer activities are physically confined to specific geographic areas, and the borders are becoming increasingly porous. Additionally, news and technology are advancing at a breakneck pace, altering the function of people in a variety of spheres of existence. Industry 4.0 is based on six design principles: interoperability, virtualization, decentralization, real-time capabilities, service-oriented architecture, and modularity (Ibda & Rahmadi, 2018). The Industrial Revolution 4.0 may be defined as an industrial age in which all entities can interact in real-time and at any time via the internet and CPS technology to generate new value or optimise current value from every process in the industry.

Digital technology advancements in the present Industry 4.0 era have altered and affected several facets of human existence, including schooling. Putrawangsa & Hasanah (2018) indicate that digital technology is the single most significant factor affecting the world's education system today. This is because of the efficacy, efficiency, and appeal. If fake physical items dominated their usage as a tool for visualizing abstract concepts in the 1980s, digital technology-based visualization is now extensively employed as a more effective, efficient, interactive, and aesthetically pleasing tool. The use of technology in education has at least three beneficial effects on Islamic education. Technology may help students achieve more in Islamic education, it can help teachers be more successful, and it can influence what and how Islamic education should be studied and taught (Hasibuan, 2015).

Islamic education is primarily concerned with three objectives: teaching Islamic knowledge (transmission of Islamic knowledge). Second is the preservation of Islamic tradition (maintenance of Islamic tradition). Thirdly, giving birth to (candidates for) ulama ('ulama' reproduction) (Azra & Jamhari, 2006). As an educational institution-based religion in Indonesia that plays a critical role in creating the Indonesian people and civilisation, Pesantren has certainly become a model for accomplishing these goals. Islamic education is the intentional endeavour of devout Muslim adults to lead and steer the growth and development of their pupils' natures (basic abilities) through Islamic teachings to their greatest point of growth and development (Priatmoko, 2018). Islamic education, in general, strives to "improve students' faith, understanding, appreciation, and experience of Islam, for them to develop into Muslim human beings who believe and fear Allah SWT and exhibit a noble character in personal, social, national, and state life" (Zakir, 2019).

Similarly to national education, Islamic education in Indonesia is beset by various tiresome issues. Because Islamic education is a subsystem of national education, when national education has been deemed a failure due to the persistence of several unresolved issues, it must be admitted that Islamic education is also a failure (Masykur, 2015). Islamic education now has internal (internal) and exterior (external) challenges if we look closely. Internal issues are evident in the ethos of Islamic education today, as seen by the education system of controlled Islamic schools, such as Islamic boarding schools, which is quite encouraging, or, if not, the quantity produced surpasses the need, resulting in overproduction. Simultaneously, other sciences focused on science and technology remain extremely scarce. Thus, it is logical to claim that "Islamic pupils lack understanding, knowledge of science and technology, communication skills, and even political awareness." It is not incorrect to assume that the

ethos of Islamic education as it exists now continues to disregard the importance of linking and matching while developing its educational system. (Noor, 2019).

Islamic boarding schools have been included in the National Education System by Law No. 18 of 2019. They serve as a venue for actualization via education, da'wah, and communal empowerment. This presents both an opportunity and a risk for Islamic residential schools. Islamic boarding schools, too, confront a difficult predicament. On the one hand, Islamic boarding schools must maintain their distinctive educational pattern (*tafaquh fiddien*). Still, on the other hand, pesantren must be responsive to issues of change that lead to a more pragmatic society (Manan, 2019). Including scientific variables other than religion into Islamic boarding schools brings Indonesia's typical Islamic educational institution problematic. In the past, people studied at Islamic boarding schools to study religious knowledge to become pious people; now, people look at Islamic boarding schools to learn spiritual understanding and for a labour market competition after they graduate (Sagala, 2015). So that the completion or not completion of a person studying at a pesantren is no longer determined by how fluent, he is in mastering a particular field of knowledge. Still, the time has limited it, which then when he enters the community can survive and can even help many people in fulfilling their lives (Syafe'i, 2017).

As the principle of change, the arrival of something new will reduce the value or eliminate something old. For this reason, pesantren must remain clear in seeing the situation. Pesantren should not lose their identity as a distinctive educational institution, but also, pesantren should not be silent witnessing the speed of the flow of change (Muttaqien, 1999). If the pesantren can respond to changing demands with various distinctive styles, the opportunity to survive will be tremendous. On the other hand, if the pesantren cannot respond well to the demands of change, inevitably, it will gradually decline, both in terms of the organization and its human resources. For this reason, changes are necessary to meet the demands of an increasingly pragmatic society (Hafidhoh, 2016).

Based on these problems, the author's main idea is how Islamic religious education taught in Islamic boarding schools responds to the demands of changing times in this era of disruption. Especially the challenges of pesantren in giving birth to a new generation of digital society who will become prospective students in the future. Therefore, the author is interested in raising the theme of research on the strategy of Islamic religious education in Islamic boarding schools in the era of the industrial revolution 4.0.

METHODS

The study technique is to conduct a library search and gather data from writings (literacy) on the subjects mentioned (Zed, 2004), specifically learning methodologies for Islamic education in Islamic boarding schools in Era 4.0. The researchers took the data from books, research journals, and supporting articles. The discussion method uses the descriptive-analytical method, explaining and elaborating the main ideas related to the topics discussed. Then present it critically through primary and secondary library sources related to the theme. It is expected to give an overview to Islamic boarding schools in responding to swift changes.

FINDINGS AND DISCUSSION

Industrial Revolution 4.0

The industrial revolution 4.0 was proposed for the first time by Klaus Martin Schwab, a German engineer and economist who founded and served as Executive Chairman of the World Economic Forum. In his book *The Fourth Industrial Revolution* (2017), he writes that we are beginning a revolution that will radically alter how we live, work, and interact with one another. The changes are profound and exponential (Schwab, 2017).

This is a significant shift from the preceding industrial revolution era. The rise of mechanization and energy based on steam and water became a landmark of the Industrial Revolution 1.0. Machines supplanted human and animal power. The steam engine of the eighteenth century was a crowning achievement. This 1.0 revolution has the potential to enhance the economy significantly. During the two

centuries following the industrial revolution, the world's per capita income grew sixfold (Ghufron, 2018).

The discovery of electrical energy and motors ushered in the Industrial Revolution 2.0. Manufacturing and large-scale production occurred. Telephones, automobiles, and aeroplanes are all instances of technological advancements. The Industrial revolution 3.0 saw the rapid change, as seen by the rise of electronics-based businesses, information technology, and automation. After this period, digital technology and the internet was widely recognized (Ghufron, 2018). Distinct from the previous industrial revolution, the 4.0 industrial revolution was characterized by the emergence of the Internet of Things, followed by advancements in data science, artificial intelligence, robots, cloud computing, three-dimensional printing, and nanotechnology. It arrived very quickly. Numerous previously unconsidered items become breakthroughs and become a sizable commercial area. Transportation has evolved with the advent of ride-sharing services such as Go-Jek, Uber, and Grab and room-sharing services such as Airbnb. This invention has even impacted the pre-existing transportation and hotel rental industries. The fourth industrial revolution introduces new business lines, new occupations, and new previously unimaginable professions. However, there are also endangered business lines, vocations, and occupations that might be automated or replaced by artificial intelligence machines and robots (Ghufron 2018).

Industry 4.0 is sometimes referred to as the digital revolution and the era of technological disruption. The digital revolution is so named due to the widespread usage of computers and the automation of records in all sectors. Industry 4.0 is a period of technological upheaval, as the industrial world's mobility and job competitiveness will become non-linear due to automation and connectivity (Anwar, 2019). Implementing artificial intelligence is one of industry 4.0's distinguishing traits (Tjandrawinata, 2016). One application is robots to replace human labour with more cost-effective, efficient, and effective labour.

Automation is possible in nearly all sectors due to technological advancements. Innovative technology and techniques that integrate the physical, digital, and biological worlds will radically alter the way humans live and interact (Nurjani, 2018). Industry 4.0, as a phase of the technology revolution, alters the extent, breadth, complexity, and transformation of human activity. Humans will even exist in a state of global insecurity. As a result, people must forecast a rapidly changing future (Anwar, 2019). Each country must adapt to these developments holistically. This reaction encompasses all global political players, public and private, academic and civil society, to transform the difficulties of industry 4.0 into possibilities (Ghufron, 2018).

At least five technologies serve as the primary pillars of the Industrial Revolution 4.0, including the Internet of Things, Big Data, Artificial Intelligence, Cloud Computing, and Additive Manufacturing.

1. Internet of Things (IoT)

The Internet of Things is a system that connects computing devices, mechanical devices, and digital machines in order to perform activities via data transmission over an internet network without needing human-to-human or human-computer contact. Four components comprise the IoT system: sensor devices, connection, data processing, and a user interface. Examples of IoT applications in Indonesia: Gowes (IoT for bike sharing), fishery (IoT for automatic fish feeders), Qlue (IoT for smart cities), and Hara (IoT for food and agriculture).

2. Big Data

Big Data is a phrase that refers to massive amounts of organized and unstructured data. However, it is not the quantity of data that matters but the organization's use of the data. Big Data analytics may be used to improve decision-making and company strategy. Indonesian Big Data Service Providers, among others: a. Sonar Platforms; b. Paques Platform; c. Data Shop; d. Dattabot.

3. Artificial Intelligence (AI)

AI is a computer or machine technology with human-like intelligence and can be adjusted according to human wishes. AI works by studying the received data continuously. The more information

it receives and analyzes, the better AI can make predictions. Chatbot applications and face recognition are examples of the application of AI.

4. Cloud Computing

Cloud computing is a technology that transforms the internet into a data and application administration hub, granting computer users access privileges (login) to configure servers (servers) via the cloud. For example, hosting a website takes the form of a virtual server. There are three types of the service model of cloud computing, namely:

- Cloud Software as a Service (SaaS), a service for using applications provided by the cloud infrastructure;
- Cloud Platform as a Service (PaaS), a service to use the provided platform, so that developers only focus on application development;
- Infrastructure as a Service (IaaS), a service to use the infrastructure that has been provided, where consumers can process, store, network, and use other computing resources required by the application.

5. Addictive Manufacturing

Additive manufacturing is a breakthrough in the manufacturing industry by utilizing 3D printing machines or often known as 3D printing. Digital design drawings that have been created are realized into natural objects with the same size and shape as the actual design or a particular scale. Additive manufacturing technology can produce more inventions and goods that traditional manufacturing techniques cannot be made.

Boarding school/Pesantren

Etymologically pesantren comes from the word "santri", which is given the prefix "pe" and the suffix "an", namely pe-santri-an, which means a place for the students. The origin of the word santri itself consists of a combination of "sant", a good human being, and "tra", which means likes to help. So Pesantren is a place to teach science to good humans. According to Gibb in Hariadi (2015), pesantren is a Javanese "santri-place", the seminary for students of theology (*santri*) on the island of Java and Madura (pesantren is a place for Javanese students, seminaries for students on the islands of Java and Madura). Pesantren is a term used in Java and Madura for educational institutions that teach Islamic teachings, while other terms are *surau*, *menuasah*, *dayah*, and *skeletal*.

As for the terminology, Steenbrink (1974) explained that pesantren came from India. Before Islam came to Indonesia, the system used by pesantren to teach Islam was already used and practised to teach Hinduism in Java. However, after Islam entered Indonesia, the plan was adopted by Islam, which later emerged the term pesantren. The term pesantren is the same as the term Koran, langgar, or surau found in Minangkabau. So pesantren can be defined as an Islamic educational institution that has its characteristics and is different from academic institutions in general. Where Islamic boarding schools teach Islamic teachings to their students, who are usually called *santri*, *kiai* figures as central figures, mosques as learning centres and students who recite the Koran must settle and live in pesantren (Alwi, 2013).

The curriculum is a critical component for deciding the topic of instruction, guiding instructional procedures, establishing success criteria, and ensuring the quality of educational outcomes. The pesantren curriculum is based on classical texts and stresses spiritual themes. The pesantren curriculum is based on the simplicity with which knowledge or issues covered in the book can be acquired and the complexity with which they can be acquired (Jaya, 2017). In general, the pesantren system is composed of five indivisible components, namely:

- a. Pondok is a dormitory where students congregate and study under the kyai's supervision. Pondok, when combined with pesantren, refers to a boarding school, a type of Islamic education institution that is peculiar to Indonesia.

- b. The mosque is a vital component of the pesantren since it serves as the focal point for applying education under the kyai's supervision.
- c. Instructing students in the classic book or the yellow book. The canonical literature taught in pesantren may be broadly classified into eight categories: Nahwu and Sharaf, fiqh, ushul fiqh, Hadith, interpretation, monotheism, Sufism, and additional disciplines such as dates and balaghah.
- d. Santri, i.e. pupils studying religious studies in Islamic boarding schools, either in the cottage or upon their return home. In other languages, santri mukim, or santri, refer to children who come from remote locations and attend Islamic boarding schools. Santri bats are pupils who originate in the areas surrounding the pesantren. Generally, they are not found in pesantren.
- e. A boarding school's e. Kyai, or boarding school caretaker, is a necessary component. On average, among the pesantren communities that evolved in Java and Madura, the figure of the kyai is extremely influential, charismatic, and authoritative, resulting in a high level of respect for the community within the pesantren setting. Kyai is a person or character who takes on the role of a key figure or role model in the pesantren milieu. Apart from being regarded as the supreme leader, the *kyai* is regarded as a reservoir of knowledge by his disciples.

The pesantren education system's overall goal is to develop citizens into Muslim individuals who adhere to Islam's teachings, instill a religious sense in all parts of their lives, and make them helpful to religion, society, and the state (Hamruni & Satria, 2016). While the pesantren education system's particular aims are:

- a. Educate pupils and community people about Islam and the importance of fearing Allah. As inhabitants of a Pancasila state, possess noble character, knowledge, abilities, and bodily and mental health.
- b. Educate students to develop into Muslim human beings who are truthful, persistent, demanding, and entrepreneurial in their approach to practising Islamic history holistically and dynamically.
- c. Educate pupils to develop their personalities and reinforce their nationalism to develop into self-sufficient individuals who are accountable for the nation's and state's growth.

Islamic boarding schools are classified into three categories based on their curriculum or educational method:

- a. Islamic Boarding School in the Traditional/Salaf Style This pesantren has retained its original shape through teaching texts written in Arabic by 15th-century clergy. The pattern of instruction is based on the *halaqah* or *mangaji tudang* system, which is implemented in the mosque. The essence of this halaqah teaching style is memory, with the final result being pupils who accept and possess information. This indicates that science does not progress toward perfection but is restricted to what the *kyai* provides. The boarding school's curriculum is totally chosen by the *kyai* who look after it.
- b. Islamic Boarding School of the Modern Era This pesantren is a development type, as it embraces the complete classical learning system and abandons the conventional learning method. This modern educational method is mostly used in learning courses, including madrasas and schools. The curriculum is drawn from the national curriculum 85—the *kyai*'s role as facilitators of the learning process and classroom teachers. The distinction between schools and madrasas is that madrasas emphasize Islamic religious instruction and Arabic as a more significant component of the local curriculum.
- c. Islamic Comprehensive Boarding School, This form of pesantren incorporates traditional and contemporary education and teaching systems elements. Education is implemented using the *sorongan*, *bandongan*, and *wetonan* methods, which are often performed at night following the Maghrib and Fajr prayers. The traditional education system is taught from morning to noon, just as it is in madrasas/schools in general.

Islamic Education in Islamic Boarding Schools in the 4.0 Industrial Revolution Era

Muslims believe that Islamic education in Islamic boarding schools has advantages and virtues because the basis and purpose depart from Allah's revelation (al-Qur'an and Sunnah). In general, Muslims understand the substance of Islamic education as a conscious effort to form a superior human person following the values of Islamic teachings (Khunaifi, 2016). Unique humans are human beings whose full potential can develop optimally, including their physical, five senses, reason, soul, intuition and spirituality. The main components of Islamic education, according to experts, are summarized in three elements, namely *al-tarbiyah* (guiding, protecting), *al-ta'lim* (teaching, developing) and *Alta'dib* (moral educating) (Sholichah, 2018).

Islamic education is still lagging behind Western education for various reasons, including the following. First, education orientation has to be explained in relation to the aims that should accompany Islamic exposure. Islamic education focuses only on the transmission of religious knowledge. Second, Islamic education preserves the ancient legacy, ensuring that the information acquired is based on traditional science and is unaffected by current science. Thirdly, Muslims are still being seduced by historical romantics. Muslims' brilliance in the past and now continues to influence their attitude. They remain proud of their prior accomplishments but are unaware that this pride is precisely what is causing them to fall behind. Fourth, the Islamic educational learning model stresses a verbalistic intellectual approach and discourages educators and students from engaging in educational exchanges and humanistic dialogue (Ma'arif, 2007).

There are two primary reasons for the importance of modernizing Islamic education in the pesantren environment. First, the concept and practice of Islamic education have historically been too narrow, emphasising the hereafter, which resulted in the scientific dichotomy that Muslims have inherited since Islam's decline (century Islam). (Mas'ud, 2002). In Islamic education, the scientific dichotomy includes (a) the division between religious and non-religious sciences, which perpetuates the monotony of religious sciences' supremacy, (b) the division between revelation and nature, which results in a shortage of empirical research in Islamic education, and (c) the division between faith and reason. Islam must be viewed through this lens as a religion of nature, in which all kinds of the contradiction between religion and science are abolished. Nature and its contents (materials and events) provide indications indicating the presence of a coherent global system. By developing them, one may comprehend the significance and wisdom of something transcendent. Second, Islamic boarding schools and educational institutions have not been able to satisfy the demands of Muslims in confronting the modern world's difficulties and the challenges confronting the Indonesian people and country in all sectors to date (Shofiyyah & Sastraatmaja, 2019).

Therefore, in order to meet the challenges of the Fourth Industrial Revolution, the concept of Islamic education is essential. As such, Islamic boarding schools are expected to be able to grow and develop the potential of children given to them by God at birth in the context of preparing them. Get out there and experience life. Pesantren 4.0 must address all of the challenges mentioned above before it can accept Islamic education. It won't be easy to adapt Islamic education to the modern world if it is not done this way. Because of this, all aspects of Islamic teaching must be reformed and revitalized. It has been said that in the age of 4.0, Islamic education must go through three stages: disruption, self-direction, and reconfiguration or construction (to borrow from Rhenald Kasali's phrase).

Disruption is facilitated by mindset. The environment shapes the mindset of the people we create prior to thinking and acting. Islamic education in the modern era is fast-paced, digital, and highly mobile, and everyone needs access to knowledge. Everything necessary must be available immediately; if access takes an extended period of time, the community will abandon the service in favor of others that are more convenient and faster to use.

Response time has a significant impact on the user experience. Ronald Kasali refers to this as the corporate mindset. Islamic boarding schools must instil this attitude in their students. As a result, users will receive less bureaucratic services. As Ronald stated, "Individuals with a corporate mindset

exhibit the following characteristics: To begin, it is not time or location-bound." It is neither time- nor space-bound. These individuals have recognized that time and location are no longer prohibitive factors in obtaining employment. When applied to the administration of Islamic educational institutions, this attitude results in establishing an effective and efficient management system. Additionally, instructors who are actively engaged in learning will be more adaptable and adaptable in their task and function performance.

Second, take an active role in the delivery of your services. Learning activities that are primarily focused on instructors passing on knowledge and are limited to the classroom will struggle to produce highly competitive graduates. The educational paradigm has shifted; it is now student-centred rather than instructor-centred. Teachers must take a more proactive role in providing facilities, advice, and support to students.

Third, maintain an unconcerned attitude toward the budget. Individuals with a business mindset do not let financial constraints stifle innovation. Fourth, maximize the functionality of social media platforms. Islamic boarding schools in the modern era must be able to communicate via previously inaccessible channels. Social networking is no longer a purely recreational activity. It has developed into a highly effective communication tool, a productivity booster, and a source of innovation inspiration. This opportunity must be fully exploited. Fifth, when confronted with obstacles, consider alternative solutions. Not preoccupied with self-preservation justifications. Sixth, I am a willing participant in change. In today's world, change has become a necessity. If an institution continues to manage in a static manner, it will lose out to a more dynamic manner.

Seventh, think and act strategically. The management procedures for Islamic educational institutions must be well defined. Achievable objectives must be stated. As a result, it is critical to reorient the curriculum and worldview of Islamic education. All curriculum, vision, annual program, and semester program components must be transparent, adaptable, contextual, and forward-thinking. Organizations that are adaptable and dynamic in their response to the tsunami of disruption employ HR (Human Resources) professionals who have a driver's mentality, not a passenger mentality. HR professionals with a strong driving mindset will be willing to open up, read situations quickly and accurately, respond with agility, be aware of all possible negative outcomes, and operate successfully, innovatively, and efficiently. These abilities are especially valuable for leaders and caregivers of Islamic boarding schools. They must develop into dependable stewards of their respective institutions. As a result, the managerial ability is insufficient on its own. It must, however, be accompanied by the capacity to lead. Meanwhile, human resources with a passenger mentality will be bureaucratic, inflexible, inefficient, and discipline-deficient.

Recreate or reconfigure. A common analogy of thought among Muslims has persisted to the present day, namely preserving the good old while adopting the better new (Kasali, 2017). However, in the industrial revolution 4.0 era, several changes are necessary, beginning with the management and professionalism required of human resources, which requires increased competence and ability. This can be accomplished in a variety of ways, including education and training, seminars and workshops, and study scholarships. Product development is another way to adapt to the industrial revolution 4.0 era. In other words, the preceding system has expired. The existing system is decommissioned, and a replacement is developed, for example, by establishing a new digital-based service system. As a result, residents of pesantren have complete access to all educational and administrative services. Another example is the evolution of contemporary learning paradigms as a result of the extensive use of digital technology, such as e-learning and blended learning.

CONCLUSION

Islamic education at Islamic boarding schools is a critical component of the national education system since it contributes significantly to developing persons with Islamic and intellectual character. The Industrial Revolution 4.0 era ushers in rapid development that are sometimes difficult for regular people to keep up with. This age, often known as the era of disruption, poses difficulties in defining and

positioning Islamic educational institutions such as Islamic boarding schools. If the pesantren continue to follow the established pattern, they must be willing to be left behind. Meanwhile, Islamic boarding schools that wish to revitalize education by adapting to the growth of information technology, a hallmark of the fourth industrial revolution, will be able to compete with other educational institutions. To achieve Islamic boarding school 4.0 status, it is important to reform and modernize all facets of Islamic education. Three measures must be taken by Islamic boarding schools in this 4.0 era: disruptive attitude, self-driving, and reshaping or creating.

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