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MEASURING THE FUTURE NEEDS OF ISLAMIC EDUCATION THROUGH THE ROLE OF ARTIFICIAL INTELLIGENCE

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Abstract:

This research aims to reveal the future needs of Islamic education through the role of Artificial Intelligence. The approach in this research uses a qualitative approach by utilizing literature review as a type of research that effectively facilitates the realization of the objectives of this research. The data collection stages are carried out systematically and structured through literature search studies that focus on the future needs of Islamic education through the role of Artificial Intelligence. Data analysis was carried out through modified analytical induction techniques in order to get a complete and structured picture so that the findings are accurate and avoid subjectivity bias. The results of this study can provide an understanding that there is a significant role of Artificial Intelligence in Islamic education in terms of teaching, learning, and administration as well as their respective impacts, there is a description of the educator paradigm in Islamic education through the the role of Artificial Intelligence which boils down to the certainty of educators in achieving the goals of Islamic education, and describes the paradigm of learners in Islamic education through the role of Artificial Intelligence which boils down to the model of learners as recipients, collaborators, and leaders.

Keywords: *Future Needs , Islamic Education , the Role of Artificial Intelligence*

INTRODUCTION

Today's modern world is heavily influenced by *Artificial Intelligence technology*. The use of *Artificial Intelligence* in everyday life is increasing (Poola, 2017) . *Artificial Intelligence* is considered as one of the solutions to do various tasks and solve problems. *Artificial Intelligence* is artificial intelligence which refers to the ability of machines or computers to imitate intelligent human behavior such as problem solving, decision making, and learning (Pasaribu & Widjaja, 2022) . The role of *Artificial Intelligence* is very important in many aspects of modern life, including in the fields of business, health, education, law, and so on. However, not a few also find it difficult to define *Artificial Intelligence,* according to him because *Artificial Intelligence* itself is an interdisciplinary field that involves researchers and experts from various fields (X. Chen et al., 2020) , for example, neuroscience, psychology, and linguistics, who continue to contribute by bringing their own perceptions, knowledge and terminology.

In the world of education, *Artificial Intelligence* is a state-of-the-art technology that allows for a level of flexibility and customisation. This technology is revolutionizing schools and classrooms, making the work of educators much easier, and can automate assessments for students (Sadiku et al., 2022) . Although *Artificial Intelligence* has the potential to transform education (Holmes et al., 2019) , good educational outcomes do not usually occur only by using advanced *Artificial Intelligence computing technologies* (Castañeda & Selwyn, 2018) More importantly, the use of different educational technology classes generally implies different philosophical and pedagogical

perspectives, which in turn has a critical influence on the quality of learning and teaching (Hwang et al., 2020) .

Artificial Intelligence is rapidly changing the world. *Artificial Intelligence* has been incorporated into many different types of technology (Sadiku et al., 2022) . *Artificial Intelligence* has the potential to impact almost all aspects of society, including automation, healthcare, business, education, engineering, law, manufacturing, transportation and security.

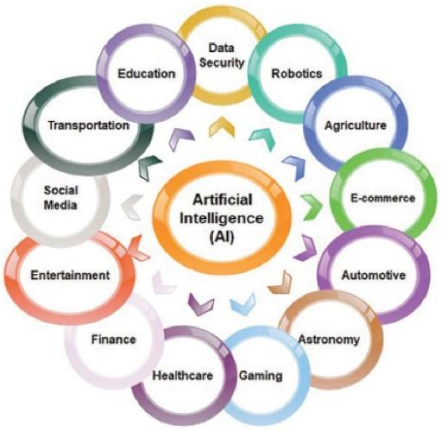

Figure 1. Application of *Artificial Intelligence* (Sadiku et al., 2022)

Islamic education is an important part of the life of Muslims. In facing the future, the role of technology, especially Artificial *Intelligence,* can make a significant contribution in improving the quality of Islamic education (Sabri, 2020) . *Artificial Intelligence* can help educators/teachers and students in various aspects of Islamic education, starting from the learning process to assessing students' understanding of the material being taught. In all, *Artificial Intelligence* can be a very effective tool to increase the effectiveness of Islamic education. Use of *Artificial Intelligence* in schools and colleges can help improve the quality of education and produce better quality graduates.

What is the future of Islamic education in the midst of rapid *Artificial Intelligence technology* ? This study aims to uncover the future needs of Islamic education through the role of *Artificial Intelligence*. Therefore, researchers are interested in further exploring the role and impact of *Artificial Intelligence* in Islamic education, the paradigm of educators in Islamic education through the role of *Artificial Intelligence,* and the paradigm of students in Islamic education through the role of *Artificial Intelligence*.

RESEARCH METHODS

Uses a qualitative approach by utilizing a literature review as a *type* of research that effectively facilitates the realization of the objectives of this study. Data comes from manuscripts, journal articles, books, and research results that have been published in national and international journals. In this study, searches of manuscripts and journal articles were carried out with the help of Springer, Elsevier, Taylor & Francis, Thomson Reuters, and Eric. In addition, the Google Scholar *search engine is also used* with the keywords *future needs, Islamic education,* and *the role of Artificial Intelligence*.

The stages in data collection are carried out in a systematic and structured manner through a literature search analysis study that focuses on the future needs of Islamic education through the role of *Artificial Intelligence*. Then, the considerations for the literature being reviewed are arranged in an orderly manner to facilitate sorting and selecting material that is truly relevant so that this study has maximum results. Data analysis was carried out through a modified analytical induction technique (Ulfatin, 2015) in order to get a complete and structured picture so that the findings are accurate and avoid subjectivity bias.

RESULTS AND DISCUSSION

The Role and Impact *of Artificial Intelligence* in Islamic Education

The Role of *Artificial Intelligence* in Islamic education boils down to teaching, learning, and administration and their respective impacts.

Artificial Intelligence in Teaching and Its Impact

Artificial Intelligence in teaching has been explored in 2020 by Lijia Chen, et al. from Yango University and Fuzhou University in China (L. Chen et al., 2020) . *Artificial Intelligence* has facilitated the creation and deployment of systems that are proving to be very useful pedagogical tools. These tools have led to improvements in the quality of teaching. Various platforms and applications *of Artificial Intelligence* as teaching tools are discussed and highlighted in the various articles evaluated. Timms discusses various applications of *Artificial Intelligence* as a pedagogical tool or teaching *platform* (simulation-based) which includes the use of different technologies, such as virtual reality to demonstrate or demonstrate concepts to students or to demonstrate material practically, providing students with real or practical learning experiences (Timms, 2016) . The same concept or application of virtual reality elements as elements of *Artificial Intelligence* in teaching is discussed in other studies. For example, Mikropoulos and Natsis highlight the use of virtual reality and include 3-D technology and highly interactive simulations as pedagogical tools, which help learners have a better understanding of the concepts being demonstrated (Mikropoulos & Natsis, 2011)

Other research has also highlighted the integration of *Artificial Intelligence* into machines or robots and the creation of powerful teaching tools and improving the quality of teaching strategies implemented. Indeed, Timms highlights that another major form of application of *Artificial Intelligence* in education as a teaching tool is the integration of *Artificial Intelligence* in educational principles in robots, the development and use of robots as educator/teacher assistants and co-workers, cobots, which can be used to perform tasks. -basic and even advanced teaching tasks, such as teaching students to read and say words (Timms, 2016) . On the other hand, Pokrivcakova also highlights the integration of *Artificial Intelligence* into computer programs, as well as the development and use of *chatbots, or online* computer-based robots with conversational and dialogue capabilities to answer students' routine questions, and in some cases also disseminate teaching materials (Pokrivčáková, 2019) . *Artificial Intelligence* equips *humanoids* or other robots with cognitive and decision-making abilities, as well as dialogue and conversational abilities, which further enable their use as teaching and pedagogical tools.

The Role of *Artificial Intelligence* for teaching purposes or as a pedagogical tool has had a major impact on educational aspects. This has increased the effectiveness, efficiency and quality of work done by instructors/educators/teachers. Efficiency and quality in this context are measured by the delivery of relevant content in accordance with the curriculum and in accordance with the special needs and abilities of students, while effectiveness is assessed from the implied absorption and retention or learning achievement by students. Therefore, *Artificial Intelligence* has driven the realization of quality, effectiveness, and efficiency in teaching (L. Chen et al., 2020) . In addition, the impact of *Artificial Intelligence* on education, especially in increasing the effectiveness and efficiency of teaching, as summarized by Roll and Wylie in their discussion of changes in *Artificial Intelligence,* that specifically *Artificial Intelligence* in the tutoring process or teaching system has been designed with the aim of solve the different challenges that stand out in one-on-one teacher-student tutoring, thereby improving the overall quality of the instructor/educator/teacher's work (Roll & Wylie, 2016) .

Artificial Intelligence in Learning and Its Impact

Artificial Intelligence in learning is still the result of exploring Lijia Chen, et al. from Yango University and Fuzhou University in China, that learning is still an integral part of education which in other aspects is also within the scope of research (L. Chen et al., 2020) . Other approaches provide learning experiences that are more enjoyable and involve learning experiences based on real experiences, thus increasing the absorption

and retention of information by students whose relation to this is also the basis of learning (Mikropoulos & Natsis, 2011) . From another perspective, *Artificial Intelligence* in learning has also removed some barriers to accessing learning opportunities, such as national and international restrictions, allowing global access to learning through online and web-based *platforms* (Sharma et al., 2019) .

On the other hand, there are applications of *Artificial Intelligence* which was found to have a major impact on the experience of learners. For example, the implementation and use of simulation-based learning and smart tutor systems have been shown to encourage deep learning which is also a way to enhance students' learning experiences (Sharma et al., 2019) . Mikropoulos also sheds light on the same concept, observing that virtual reality and simulation promote enhanced learner learning experiences (Mikropoulos & Natsis, 2011) . It turns out that the use of simulation, virtual reality, and other aspects of *Artificial Intelligence* in learning is proven to be able to prepare students to deal with futuristic trends with a gradual tendency to keep pace with the application of *Artificial Intelligence* in industry (Wartman & Combs, 2018) .

The impact of learning through the role of *Artificial Intelligence* has not been overlooked, for example *Artificial Intelligence* has been used to encourage and foster academic honesty and integrity (Sutton, 2019) , improve study and learning through the use of revision and writing tools, such as Turnitin tools, revision tools, and the *Write-to-Learn* tool (Murphy, 2019) , as well as other research that has highlighted the possible detrimental impact of the role of *Artificial Intelligence* on learning. Crowe, et al., in their research have observed that *Artificial Intelligence* can encourage dishonesty and endanger academic integrity because *Artificial Intelligence* can facilitate or enable students to use paper mills and paper manufacturing sites or *platforms* (Crowe et al., 2017) . But in general, the benefits of *Artificial Intelligence* for learning have been able to overcome various existing challenges (L. Chen et al., 2020) .

Artificial Intelligence in Administration and Its Impact

Artificial Intelligence in administration is still the result of exploring Lijia Chen, et al. from Yango University and Fuzhou University in China, that one of the main areas in education identified through the role of *Artificial Intelligence* is the implementation of various administrative tasks in the educational process, such as student assignments and review of papers, assessments, and providing feedback to students (L. Chen et al., 2020) . According to Sharma et al., *Artificial Intelligence* in education, especially in distance and *online education* today has increased efficiency in institutional and administrative services (Sharma et al., 2019) . Currently, in certain programs, it seems that the burden on instructors/educators/teachers is lightened because they provide a platform for feedback to students based on interactions within the platform. A similar position is evident in other studies and publications discussing the ease of systems in completing administrative tasks. For example, Mikropoulos and Natsis argue that harnessing and using *Artificial Intelligence* in education has boosted effectiveness and efficiency in the performance of administrative tasks, such as assessing student assignments (Mikropoulos & Natsis, 2011) . *Artificial Intelligence* has increased efficiency in the performance of various administrative tasks that would certainly feel different and require a lot of time for instructors to carry out if *Artificial Intelligence* did not exist.

In many different forms and functions, *Artificial Intelligence* has had a major impact on the performance of administrative and management functions in the world of education. This has enabled instructors or teachers to carry out their administrative functions, such as assessing and providing feedback to students more effectively (L. Chen et al., 2020) . *Artificial Intelligence* has made the performance of administrative tasks easier and increased the efficiency and effectiveness of instructors /educators/teachers in providing instruction and guidance to students. Intelligent tutoring systems provide various functions that enable instructors/educators/teachers to perform various administrative tasks, including assessing and providing feedback (Rus et al., 2013) . Other programs such as Grammarly, Ecree, PaperRater, and

Turnitin that utilize *Artificial Intelligence* also make it easy for instructors/educators/teachers to carry out administrative functions, including checking plagiarism, assessing, and providing feedback to students regarding areas of improvement. *Artificial Intelligence* has significantly reduced the documents and workload of instructors/educators/teachers, especially in carrying out various administrative functions, thus enabling them to focus on disseminating content and materials that are in accordance with the applicable curriculum at the institution and nationally (Chassignol et al. , 2018) .

Educator's Paradigm in Islamic Education through the Role of *Artificial Intelligence*

With the current era that is increasingly complex, the world of Islamic education faces various challenges. The fact that is no less important is that the role of the teacher in the process of Islamic education cannot be completely replaced by technology, because "technology" educators/teachers cannot exemplify character values (Saihu, 2021) . Technology cannot set an example, but humans will always be able to set an example. Therefore, the role of *Artificial Intelligence* in this case is not needed. The process of instilling values and character must be carried out to achieve the goal of Islamic education itself, namely to become a human being with good morals. Technology is quite helpful from an administrative point of view, while increasing the effectiveness and efficiency of learning really requires the role of educators/teachers to transfer morals and exemplary to students.

Artificial intelligence makes people talk about big changes that affect life. The emergence of technology that matches human intelligence which seems to be able to hear, see, know, speak, will, and is intelligent, but these "creatures" are still lifeless and soulless. Biologically, the human brain is the center of all activities of the human body both consciously and unconsciously. The human brain functions as a processor in the computer's CPU (*Central Processing Unit*) for the human body which consists of a network of nerves. Even though technology is made intelligent by imitating the work of the nervous system of the human brain, it still cannot match the sophistication of the human brain created by Allah SWT. (Saihu, 2021) . Humans are so special compared to other creatures, especially in terms of the gift of reason, so it must be understood that no matter how good humans are in "creating" robots through Artificial Intelligence technology, *they* will never be able to match Allah's creations.

An interesting explanation from a professor in the field of *Artificial Intelligence* on the Informatics Engineering page of UIN Sultan Syarif Kasim Riau, namely Prof. Dr. Mohd Zakree Ahmad Nazri (also Chair of the National University of Malaysia Doctoral Program) who linked *Artificial Intelligence* and Sunnatullah (Informatics Engineering of UIN Sultan Syarif Kasim Riau, 2015) . He added that the Sunnatullah in question is Allah's law or decree, which Western scientists call *Nature's Law, Intelligent Design,* and so on which encompasses the laws of physics, biology, chemistry, astrology, and so on. Sunnatullah is a system and rules that Allah SWT. define for humans, animals, and all kinds of creatures in this world. Sunnatullah will not change and no one can change it except Allah SWT. This is in accordance with His Word in QS Faathir [35]: 43..

Translated:

"..... Then you will not get changes to Allah's decree (Sunnatullah), and you will not find deviations from Allah's decree (Sunnatullah) ".

The Student Paradigm in Islamic Education through the Role of *Artificial Intelligence*

The paradigm of students in Islamic education through the role of *Artificial Intelligence* leads to the paradigm of students as recipients, as collaborators, and as leaders.

Learners as Recipients

The paradigm of students as recipients and *Artificial Intelligence* as this director was initiated in 2021 by Fan Ouyang and Pengcheng Jiao of Zhejiang University in China (Ouyang & Jiao, 2021) . *Artificial Intelligence* represents domain

knowledge and directs the learning process, while students act as recipients of *Artificial Intelligence services* to follow certain learning paths. The theoretical foundation of this paradigm is behaviorism, which emphasizes the construction of carefully arranged content sequences that lead to the correct performance of learners (Skinner, 1953) . In addition, this paradigm views learning as strengthening knowledge acquisition through programmed instruction that introduces new concepts in a logical and gradual way, offers appropriate feedback to students about incorrect responses, and maximizes positive reinforcement (Schommer, 1990) . Learners act as recipients to react to predetermined knowledge sequences, follow learning procedures and paths, and carry out learning activities set by *Artificial Intelligence* to achieve predetermined goals (Holmes et al., 2019) . In this paradigm, *Artificial Intelligence systems* inherit the characteristics of teaching machines (Skinner, 1958) to make logical presentations of subject knowledge, require open responses from learners, as well as present direct knowledge of truths (Burton et al., 2004) . The *Artificial Intelligence* system is not centered on students who are learning, knowledge and skills that are included in the students themselves, as well as feedback that is not adapted to students, because the role of *Artificial Intelligence* in this paradigm is only as a guide.

The main issue in this paradigm is determined by how much and what type of information is needed to adequately represent, diagnose, and guide the acquisition of knowledge and skills (Ouyang & Jiao, 2021) . In this paradigm, although some systems collect student information to diagnose learning conditions, it is the system that then determines the content, procedures, and learning objectives, while students are "forced" to follow a certain learning path provided by the Artificial Intelligence system. (Du Boulay, 2019) . Because of this, expert views can lead to stereotypes regarding the knowledge and skills expected by *Artificial Intelligence systems* to be achieved by students (Kay, 2000) where the characteristics, needs, and goals of students are something that is also very worthy of consideration.

Learners as Collaborators

The paradigm of students as collaborators and *Artificial Intelligence* as supporters is still the idea of Fan Ouyang and Pengcheng Jiao from Zhejiang University in China, that the *Artificial Intelligence* system releases its controlling power to function as a supporting tool, while students act as collaborators with the system to focus on learning process. This paradigm is based on cognitive and social constructivism views of learning, which reflect the idea that learning occurs when learners interact with other humans and information technology in a social context (Vygotsky & Cole, 1978) . Specifically, the *Artificial Intelligence system* collects information that emerges from individual students as input to then optimize learning models adaptively, while the students themselves act as collaborators to communicate with *Artificial Intelligence systems* to achieve better or more efficient learning (Rosé et al., 2019) . Overall, this paradigm makes an important step towards learner-centred individual learning through mutual interaction and continuous collaboration between learners and *Artificial Intelligence systems*.

The main issues in this paradigm are determined by the extent to which and how student information is integrated into *Artificial Intelligence systems* to optimize learning models, reflect various aspects of learning status, and develop adaptive learning and instruction supported by *Artificial Intelligence.* (Ouyang & Jiao, 2021) . A common issue faced is the lack of continuous communication or synergistic human-computer interaction. This interaction is complicated because neither the information/data of students nor the status of the system is static or simple. Both have complex hierarchical structures and both change dynamically during the learning process. In other words, it is very important for *Artificial Intelligence systems* to offer *real-time data analysis* and direct feedback to students and then students use the feedback to improve the ongoing learning process. Therefore, it will be beneficial if the *Artificial Intelligence system* maintains the continuous collection and analysis of data generated by students, and provides real *-time exploration opportunities* for students to make decisions in the learning process.

Learners as Leaders

The paradigm of students as leaders and *Artificial Intelligence* as empowerers is still the idea of Fan Ouyang and Pengcheng Jiao from Zhejiang University in China, that students as leaders hold agency as the core of *Artificial Intelligence*. (Bandura, 2006) and views *Artificial Intelligence* as a tool to improve human intelligence (Law, 2019) . This paradigm reflects the perspective of complexity theory which views education as a complex adaptive system (Mason, 2013) , where there is synergistic collaboration between various entities in the system which is very important to ensure an increase in the intelligence of students. In this complex system, *Artificial Intelligence* needs to be designed and implemented with the awareness that *Artificial Intelligence techniques* is part of a larger system consisting of students, instructors/educators/teachers, and other humans (Riedl, 2019) . In order to achieve synergistic collaboration in complex systems, concepts such as human-computer cooperation (Hoc, 2010) , *Artificial Intelligence systems* and human-centered *Machine Learning* (Riedl, 2019) , human collaboration and *Artificial Intelligence* (Hwang et al., 2020) , as well as human-centered artificial intelligence in education (Yang et al., 2021) are proposed to approach *Artificial Intelligence* from a human perspective by considering the human condition, expectations, and context. In this paradigm, *Artificial Intelligence* assist learners and instructors /educators/teachers to achieve enhanced intelligence by providing high levels of transparency, accuracy, and effectiveness (Riedl, 2019) . The instructor/educator/teacher is then provided with support that can be understood, interpreted, and personalized by the *Artificial Intelligence* system to encourage learner-centered learning (Roll & Wylie, 2016) . Learners take control to act as leaders in their own learning process, manage the risk of automation of *Artificial Intelligence decisions,* and develop better and more efficient learning (Gartner, 2019) . Overall, this paradigm is a trend in the development of *Artificial Intelligence* in reflecting the ultimate goal of applying *Artificial Intelligence* in education, namely to improve human intelligence, ability, and potential (Law, 2019)

The main issues in this paradigm are determined by efforts to adjust the complexity of the learning process to the complexity of *Artificial Intelligence systems* and the complexity of educational contexts (Ouyang & Jiao, 2021) . To develop this paradigm, *Artificial Intelligence* in the future it should be designed and operated in such a way as to offer a constant means of communication to gather values and interpretations from all stakeholders, to align the *Artificial Intelligence model* with human values throughout its operations, and to create goals that are compatible with the learning centered on learners (Segal, 2019) . This issue requires not only *Artificial Intelligence systems* to support emerging and changing learning processes, capitalizing on learner trends and behaviors while providing interpretable and actionable *outputs to learners, but also empowering learners and instructors/educators/teachers to reflect on the process and learning and instructional goals, inform Artificial Intelligence* systems to adapt and lead to iterative learning development cycles (Riedl, 2019) . Finally, this paradigm aims to empower learners to take a full role in the learning process, optimizing *Artificial Intelligence techniques* to provide real-time insights into emerging learning, as well as rethinking the learning changes brought about by *Artificial Intelligence* in complex and interconnected learning systems.

CONCLUSION

The role of *Artificial Intelligence* in Islamic education boils down to teaching, learning, and administration and their respective impacts. The role of *Artificial Intelligence* for teaching purposes or as a pedagogical tool has had a major impact on educational aspects. This has increased the effectiveness, efficiency and quality of work done by instructors /educators/teachers. Efficiency and quality in this context are measured by the delivery of relevant content in accordance with the curriculum and in accordance with the special needs and abilities of students, while effectiveness is assessed from the implied absorption and retention or learning achievement by students. Therefore, *Artificial Intelligence* has driven the realization of quality,

effectiveness and efficiency in teaching. *Artificial Intelligence* in learning has also removed some barriers to accessing learning opportunities, such as national and international restrictions, allowing global access to learning through online and web-based *platforms*. In a variety of different forms and functions, *Artificial Intelligence* has also had a major impact on the performance of administrative and management functions in the world of education. This has enabled instructors or teachers to carry out their administrative functions, such as assessing and providing feedback to students more effectively.

With the current era that is increasingly complex, the world of Islamic education faces various challenges. The fact that is no less important is that the role of the teacher in the process of Islamic education cannot be completely replaced by technology, because "technology" educators/teachers cannot exemplify character values. Therefore, the role of *Artificial Intelligence* in this case is not needed. The process of instilling values and character must be carried out to achieve the goal of Islamic education itself, namely to become a human being with good morals. While the paradigm of students in Islamic education through the role of *Artificial Intelligence* leads to the paradigm of students as recipients (and *Artificial Intelligence* as directors), as collaborators (and *Artificial Intelligence* as supporters), as well as leaders (and *Artificial Intelligence* as empowerers).

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