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A PRELIMINARY INTEGRATION OF ENGINEERING EDUCATION AND REVEALED KNOWLEDGE THROUGH CLOSED-LOOP CONTROL SYSTEM MODEL

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Abstract: *Engineering education emerged in the Western world during the 18th century as a result of the Industrial Revolution. It is deeply rooted in the secular and liberal ideologies inherent in Western society. However, certain aspects of these ideologies contradict Islamic principles and fail to address the religious and cultural needs of Muslim students. Consequently, there is a growing demand for the Islamization of engineering education, aiming to imbue the curriculum with Islamic values and teachings. However, the implementation of this concept faces significant obstacles, primarily due to the lack of adequate teaching materials and the shortage of Muslim engineering educators who uphold Islamic values and are committed to integrating them into engineering education. To address these challenges, this research paper presents an innovation in the delivery of engineering knowledge by integrating it with revealed knowledge from the Qur'an and Sunnah. Using control system terminologies, a closed-loop control system model is proposed to convey the concept of human existence. The model is designed to emphasize the significance of revealed knowledge as a source of guidance in human life by positioning it as the controller, since it served as the final and preserved guidance for mankind. This model was introduced to Semester 5 students enrolled in the Control Systems subject during the March–August 2025 semester (20252) at the Faculty of Electrical Engineering, UiTM Cawangan Pulau Pinang. Findings from surveys conducted before and after the model's introduction show a significant improvement in students' understanding of the concept of human existence, while simultaneously strengthening their foundation in engineering concepts. By bridging the gap between engineering knowledge and revealed knowledge, the model aspires to produce engineers who not only excel in technical competence but also embody Islamic values, thereby contributing positively to society. The proposed model contributes to the ongoing discourse on the Islamization of education within the field of engineering.*

Keywords: *Control Systems, Engineering Education, Ethics, Human Existance, Islamization of Education*

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Introduction

The concept of the Islamization of knowledge or Islamization of education was first articulated during the First World Conference on Muslim Education in 1977 (Mabud, 2016). Initiated by Muslim scholars, the conference aimed to address key challenges facing by the Muslim ummah, such as backwardness, illiteracy and ignorance caused by the colonial hegemony. It also highlighted the problem of educational dualism where traditional Islamic education, marked by rigidity and *taqlid*, had become disconnected from modern developments, while contemporary Muslim education was increasingly shaped by Western secular ideals (Mabud, 2016 ; Saqeb, 2000). The agenda of Islamization of education emerged from the conference to bridge the dualistic nature of education in the Muslim world by integrating Islamic principles into the whole components of education systems including teachers, students, curriculum, instructional materials, teaching methods, assessment, learning environment, and community engagement (Ullah, 2019). The ultimate aim of the Islamization of education is to develop morally upright individuals who recognize and submit to God, the Creator (Al-Attas, 1980). Such recognition enables a person to align their will with the divine will (Baqui, 2012).

In Islam, the significance of education is emphasized as in the hadith: "Seeking knowledge (*'ilm*) is obligatory upon every Muslim" (Mishkat al-Masabih, n.d., Hadith 18). The term knowledge (*'ilm*) encompasses both empirical and revealed forms of knowledge (Saqeb, 2000). Empirical knowledge refers to understanding that is derived from observation, experience, or experimentation within the physical world, and includes disciplines such as the natural sciences, social sciences, historical studies, and applied sciences. In contrast, revealed knowledge relates to metaphysical truths that go beyond the limits of physical observation. For Muslims, the primary sources of revealed knowledge are the Qur'an and the Sunnah. This category of knowledge plays a central role in affirming belief in the ultimate Creator and addresses fundamental existential questions often referred to as the "Five Big Questions": Where did I come from? Who am I? Why am I here? How should I live? and Where am I going? The integration between empirical and revealed knowledge is important for preserving Islamic mindset among the younger generation of Muslims. Islamic mindset includes the recognition of the human soul and its relationship with God, and the awareness of accountability in the Hereafter. This mindset can only be cultivated with the realization on the importance of revelation as the source of knowledge.

Engineering education originated in the West during the Industrial Revolution in the 18th century (Cardoso, 2022). It is influenced by a liberal mindset deeply rooted in Western thought (Grayson, 1980). Liberal values such as individual freedom, gender equality, and moral relativism often conflict with Islamic principles, which emphasize communal obligations, defined gender roles and relations, and absolute moral codes. Furthermore, engineering education has been significantly influenced by secularism. In the context of education, secular education has its roots in the Renaissance period, when it began to develop by separating itself from the teachings of the Catholic Church while promoting scientific reasoning, rational inquiry, and critical thinking (al-Faruqi,1981). Over time, this approach became widely institutionalized across Western educational systems and extended its influence into professional and technical disciplines, including engineering (Gutek, 2005 ; Hameed, 2012).

Today, most engineering programs globally, including those in Muslim-majority countries, are modelled after Western institutions. Their curricula are often benchmarked against Western standards and reflect secular educational values (Hameed, 2012). The rapid advancement of technology and the globalization of education have further accelerated the dissemination of

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these values across borders. As a result, Muslim societies are increasingly exposed to secular educational systems, which may inadvertently impact the religious beliefs and spiritual development of the younger generation (Hashim, 2020). Consequently, efforts to instil an Islamic mindset in the younger Muslim generation, particularly within engineering education, face growing challenges.

Fundamental framework for the Islamization of education was layout through several World Conference on Muslim Education. Many recommendations were suggested by the committee to enable the process of Islamization of education (Saqeb, 1997). One of the recommendations is to reformulate natural and applied sciences subjects to conform to the spirit of Islam (Saqeb, 2000). The reformulation process involved the integration of the revealed knowledge and empirical knowledge and needs to be done at all levels of formal education; primary, secondary, and tertiary.

At the tertiary level, the International Islamic University Malaysia (IIUM) was established as a result of the series of Muslim education conferences (Saqeb, 1997 ; Obaidullah, 2010). It offers programs guided by a vision and mission aligned with the Islamization of education (Abdallah et al., 2011). To embed Islamic and ethical values into its curriculum, several key initiatives have been implemented at the program level: (i) the integration of selected Islamic subjects into the program structure, (ii) the inclusion of a specific program learning outcome dedicated to supporting the Islamization agenda, and (iii) the publication of textbooks aimed at aligning tertiary education with Islamic principles (Obaidullah, 2010 ; Mamun, 2020). Universities are also responsible for producing publications that contribute to enriching the research culture within Muslim society (Saqeb, 2000). Additionally, Arabic language courses have been made compulsory for all students (Obaidullah, 2010). However, the implementation of Islamization of engineering education, is still far from being perfect and seems more challenging as compared to other Kulliyyahs such as Kulliyyah of Laws and Kulliyyah of Economics (Zain, 2016).

For the Islamization of engineering initiatives implemented at the program level to be successful, the reformulation of engineering education at the subject level is crucial to achieve seamless integration. However, implementation at the subject level faces challenges, primarily due to a shortage of engineering educators who are well-versed in and committed to teaching in accordance with the Qur'an and Sunnah (Ahmad, 2012). Most engineering instructors were trained in liberal-secular systems and tend to adopt pedagogical approaches that reflect those frameworks and objectives. To the best of the author's knowledge, only one case study has been identified in the literature that highlights an engineering instructor who successfully integrated Islamic values into her subject (Ahmad, 2011). This suggests that the majority of Muslim engineering instructors may either be hesitant or lack the necessary capacity to incorporate Islamic teachings into their courses. Furthermore, engineering subjects are highly mathematical and technical in nature, making it challenging to identify appropriate content for integration with Islamic knowledge, consequently impedes the progress of identifying and developing suitable teaching materials (Zain, 2016 ; Ahmad, 2011). Amid these challenges, even small-scale initiatives become crucial in moving forward the Islamization of engineering education agenda.

To support this agenda, this study adopts an approach to the Islamization of engineering education by integrating appropriate engineering content with revealed knowledge derived from the Qur'an and Sunnah, without extending into the philosophical dimensions of Islamic

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thought. The primary objective of this integration is to enhance awareness of the relevance and importance of revealed knowledge in everyday life, particularly within the context of engineering education, where students are predominantly engaged with technical subjects. The integration of revealed knowledge serves as a continuous reminder to Muslim engineering students of their responsibilities as servants and vicegerents of Allah. Furthermore, this initiative provides a platform for engineering educators to incorporate and convey Islamic teachings through the lens of engineering content.

Due to the highly mathematical and technical nature of engineering subjects, they are inherently complex and demanding. Thus, the integration of revealed knowledge may impose constraints in terms of time and the required expertise. Therefore, appropriate subjects and content must be carefully selected to avoid overburdening the syllabus, teaching preparation time, and student learning time. As a test case, the Control Systems subject was selected, focusing specifically on the basic content namely, the concept of the closed-loop control system. The integration of revealed knowledge with this concept requires minimal time and can be effectively delivered within a single lecture, without the need for additional evaluation for course outcome measurement.

Methodology

To bridge the gap between the Islamic principles derived from revealed knowledge and the concept of closed-loop control system, a block diagram model representing the concept of human existence from Islamic perspective is proposed as another example of a closed-loop control system. The model was presented to Semester 5 students enrolled in the Control Systems subject for the March–August 2025 semester (20252) at the Faculty of Electrical Engineering, UiTM Cawangan Pulau Pinang. To evaluate the effectiveness of the model in enhancing students' understanding of the concept of human existence based on revealed knowledge, a pre- and post-survey was conducted and analyzed.

To enable the integration, students were first introduced to the underlying theoretical concepts of the closed-loop control system using the general block diagram of closed-loop control system shown in Figure 1. Key terminologies, as presented in Table 1 were defined and explained to enhance understanding of the concept.

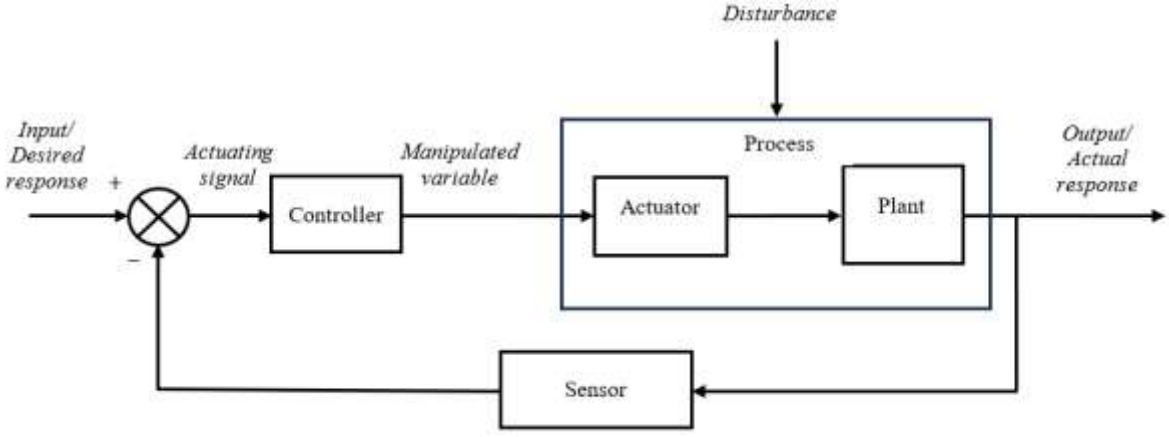

Figure 1: General Block Diagram of Closed-Loop Control System

Source: Nise, N. S., 2019.

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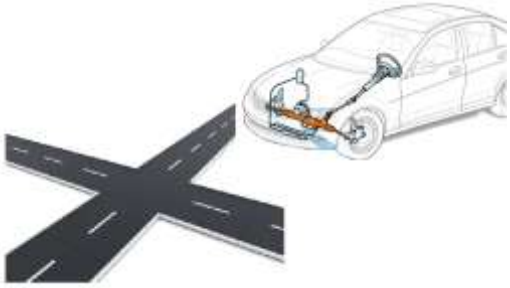
Table 1: Control Systems of Common Terminologies

Terminologies	Definition
Input/ references	Desired response
Output/ controlled variable	Actual response
Disturbance	Outside influences that impacting the system response
Error/ actuating signal	The difference between the input than output to actuate the controller
Manipulated variable	The input variable of the actuator
Actuator	A device that translates energy, typically electrical, pneumatic, or hydraulic, into motion or action
Process/ plant	The part of the system to be controlled
Controller	A mechanism that seeks to minimize the difference between the output and the input.
Sensor	A device to detect the output response

Then, several examples of real-world engineering applications were presented to reinforce understanding. For example, the automobile manual steering system, as shown in Figure 2, was presented and explained. Figure 2(a) and 2(b) show a manual steering system of an automobile and its closed-loop block diagram, respectively. Referring to Figure 2(b), the input of the system is the desired direction, while the output is the actual direction of the vehicle. The driver's eyes function as sensors, capturing the vehicle's current heading. This information is transmitted to the brain via the nervous system. The brain processes the data by comparing the actual direction with the desired direction. If a deviation is detected, the brain generates a corrective signal and transmits it to the hands to adjust the steering wheel. The hands and steering wheel act as actuators, initiating the necessary changes to the vehicle's body and wheels, which represent the plant. Under certain conditions, disturbances such as the presence of other vehicles, road surface irregularities, or adverse weather may affect the plant's output (actual direction). This example highlights the critical role of the controller in a closed-loop control system. It demonstrates how the controller ensures that the actual response (output) aligns with the desired response (input) by continuously monitoring feedback and making necessary adjustments. Students should understand that the controller is essential in maintaining system accuracy and stability by minimizing deviations caused by internal or external disturbances.



(a)

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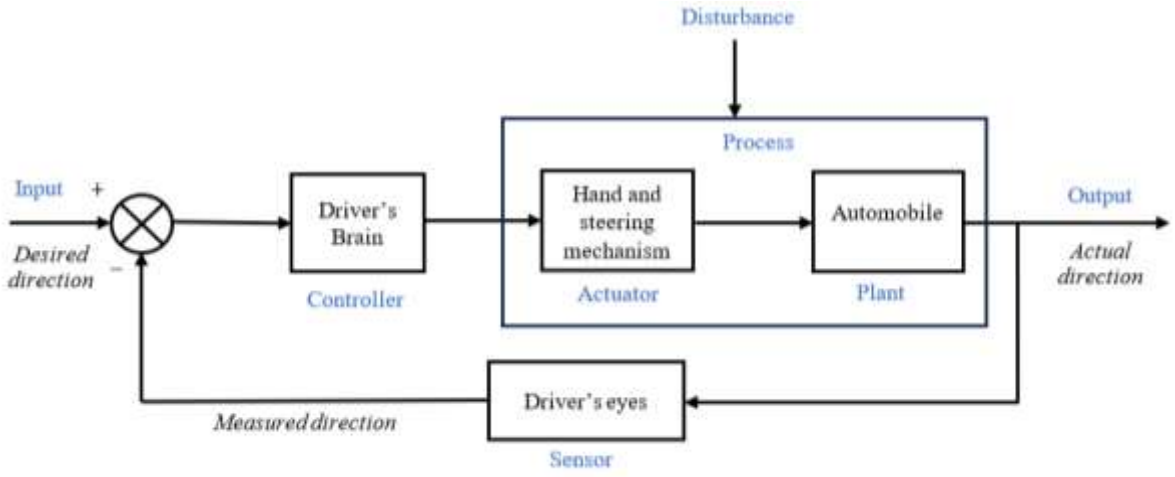

(b)

Figure 2: Closed-Loop Control System-An Engineering Example (A) Automobile Manual Steering System, (b) Block Diagram of Automobile Manual Steering System.

The Proposed Model

Figure 3 presents the proposed model, which is designed to address five fundamental questions of life from an Islamic perspective: (i) Where did I come from? (ii) Who am I? (iii) Why am I here? (iv) How should I live? and (v) Where am I going? The model aims to foster an Islamic mindset that encourages students to reflect on these questions, thereby deepening their understanding of the concept of human existence. More importantly, the model is designed to emphasize the significance of revealed knowledge in manoeuvring one's life, especially in the face of external challenges that may divert individuals from their divine purpose. To support this, the model incorporates preselected references to Qur'anic verses and Hadiths to expose students to relevant revealed knowledge. A detailed explanation of the model's components is provided in this section.

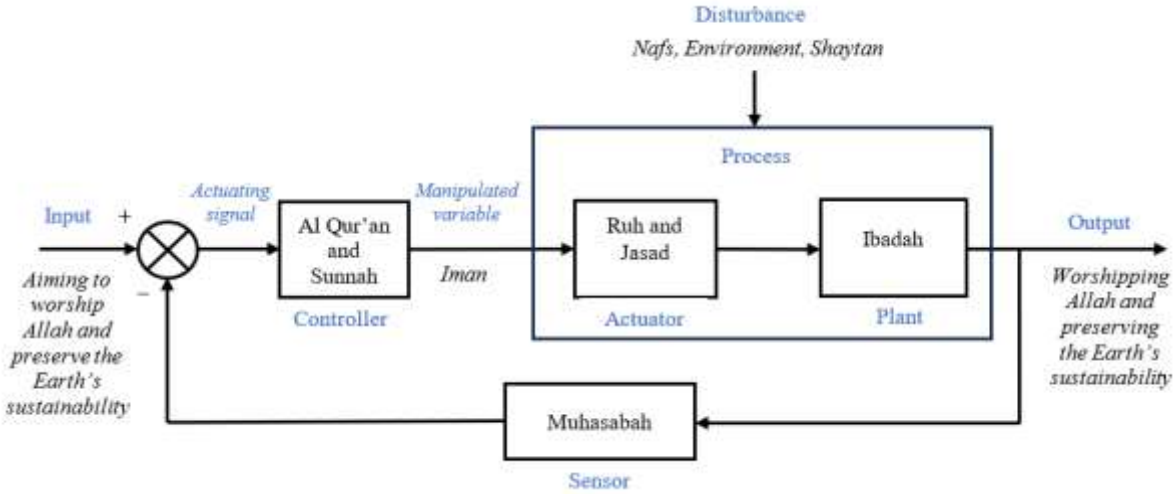

Figure 3: The Block Diagram of The Concept of Human Existence

Input

The input, or desired response, for this model is to answer the question: "Why am I here?" From the Qur'anic perspective, humans are created to worship Allah (Qur'an, 51:56) and to serve as His successive authority on Earth (Qur'an, 2:30). The term "successive authority" in Arabic is

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khalifah, meaning vicegerent of Allah. As vicegerents, it is the responsibility of humans to preserve the Earth and its inhabitants, and to maintain a sustainable environment for future generations. To effectively fulfil this noble duty, it is essential to seek Allah's guidance by being devout in worship. This input holds significant relevance and may serve as a guiding principle for Muslims. A deep understanding of the purpose of human existence enables Muslims to direct their efforts toward nurturing and sustaining the Earth in accordance with Allah's divine will.

Output

The intended outcome of this model is to nurture individuals who are both devout worshippers and actively engaged in promoting planetary sustainability as vicegerent. This dual responsibility is deeply rooted in Islamic teachings. In Islam, the role of vicegerent refers to the responsibility of human beings to act as Allah's representatives on Earth. This role involves following divine law and avoiding actions driven by personal desires (Qur'an, 38:26). Human conduct, therefore, must be guided by the teachings of the Qur'an rather than individual inclinations. Another key duty of the vicegerent is to uphold justice, which is considered a central value in Islamic teachings. According to the Qur'an (57:25), justice must be based on the guidance provided by Allah through revelation. This ensures fairness and the protection of rights in society. A further critical responsibility is to avoid causing corruption or destruction on Earth (Qur'an, 7:56). This includes taking care of the environment, using resources wisely, and promoting peace and harmony.

Fulfilling the role of a righteous vicegerent requires embodying the attributes of a devout Muslim who demonstrates sincere submission and unwavering commitment to religious obligations (Qur'an, 2:285, 24:51). This commitment reflects a personal readiness to uphold the teachings of Islam as outlined in the Qur'an and Sunnah. At the same time, it signifies a broader willingness to comply with established laws and societal norms, demonstrating a holistic sense of moral responsibility and accountability. Islamic eschatology teaches that every soul will be held accountable for its deeds (Qur'an, 23:102–103). This belief in accountability profoundly shapes a Muslim's mindset, particularly in preparing for the afterlife, which is regarded as the ultimate and eternal destination. As such, this narrative addresses the existential question: "Where am I going?"

Controller

The Qur'an and Sunnah, the two primary sources of revealed knowledge in Islam (Muwatta Imam Malik, Book 46, Hadith 1628), serve as the controller in this model. The Qur'an was revealed as a comprehensive guide for humanity on how to live a fulfilling and meaningful life in accordance with the will of Allah (Qur'an, 2:185). It consistently reminds human beings of the primary purpose of their creation. The Sunnah, on the other hand, encompasses the teachings and practices of Prophet Muhammad (PBUH) throughout his 23 years of prophethood. These teachings were recorded by his companions and subsequently compiled by later generations (*tābiʿīn* and *tābiʿ al-tābiʿīn*) into collections of hadith. Through the Sunnah, Muslims learn how to perform essential religious rituals. The importance of following and obeying the Prophet is consistently emphasized in the Qur'an (Qur'an, 3:31–32, 132), highlighting the vital role of the Sunnah in guiding Muslim conduct. The Qur'an and Sunnah offer profound guidance for humanity, which becomes more meaningful when their messages are thoughtfully understood and deeply reflected upon (Qur'an, 38:29). Fostering a solid understanding of revealed knowledge can play an important role in shaping Muslim education.

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In its absence, Muslim mindset be more susceptible to external influences that do not align with Islamic values.

Manipulated variable

Through contemplation of the Qur'an and the study of Hadith, Muslims gain knowledge that strengthens their faith (*iman*). According to the Qur'an (8:2–3), true believers are those whose hearts are filled with reverence and fear when Allah is mentioned, and whose *iman* increases upon hearing His revelations. They demonstrate complete trust in Allah, establish regular prayers, and give in charity from what Allah has provided them. Hence, *iman* is selected to be the manipulated variable which is the output of the controller that drives the actuator (*ruh* and *jasad*) to act accordingly. *Iman* represents the foundational belief system of a Muslim. From a young age, Muslims are introduced to the six pillars of faith: i) Belief in Allah, ii) Belief in the angels, iii) Belief in the revealed scriptures, iv) Belief in the messengers, v) Belief in the Day of Judgment, and vi) Belief in divine decree (*Al-Qadar*). Developing a strong connection with the Qur'an and Sunnah nurtures these beliefs and reinforces one's *iman*. As a result, firm faith becomes the driving force behind a Muslim's actions (*ibadah*), guiding them to live in accordance with Islamic teachings.

Process

In control systems, the process or plant refers to the part of the system that is to be controlled. In this model, the act of worship or purposeful actions (*Ibadah*)is selected to be the plant. *Ibadah* is performed by Muslims to show their submission, devotion, and obedience to Allah (God). In essence, *ibadah* is a way for Muslims to strengthen their relationship with Allah and seek His blessings and forgiveness. *Ibadah* is not only limited to rituals such as prayer (*salah*), fasting (*sawm*), giving charity (*zakat*), pilgrimage to Mecca (*hajj*), and reciting the Qur'an but also encompassed the whole life and death for the sake of Allah (Qur'an, 6:162). Believers are instructed in the Qur'an to embrace Islam in its entirety (Qur'an, 2:208), highlighting the comprehensive nature of submission to divine guidance. This verse underscores that selective adherence to the commands of Allah and His Prophet is not aligned with the holistic commitment expected of a Muslim. *Ibadah* may also be interpreted as righteous deed (*amal salih*). The term *amal-salih* is repeatedly paired with *iman* as the criteria for eternal success in achieving paradise (Qur'an, 2:25, 2:82, 4:57, 4:122). Islamic teachings encourage Muslims to align all aspects of life such as marriage, relationships, education, wealth, health, and career with the will of Allah. Thus, *ibadah* addresses the fundamental question, "How should I live?".

To carry out *ibadah*, the model identifies two essential human components, the soul (*ruh*) and the body (*jasad*) as the actuators. These elements work together to translate the internal state of *iman* into *ibadah*. In the Qur'an, the creation of the human body begins with the creation of Adam (Qur'an, 32:7; 23:12). His descendants are then conceived through the biological process involving the union of semen and egg in the womb. The detailed stages of embryonic development are further described (23:13–14). Life is completed with the infusion of the *ruh*, which brings the *jasad* into a living being (32:9). Mostly importantly, humans are equipped with senses especially sight and hearing as tools to contemplate the existence of Allah using their heart and intellectual through His creation and revelation (Qur'an, 32:9). Despite being the supreme creation of Allah, human beings are also created with inherent weaknesses. The Qur'an describes them as weak (Qur'an, 4:28), hasty (Qur'an, 17:11), ungrateful (Qur'an, 17:67), stingy (Qur'an, 17:100), and argumentative (Qur'an, 18:54). These limitations are not flaws, but rather divinely ordained challenges intended to test and refine human character. The

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knowledge of human origin and purpose, as revealed through divine guidance, addresses two fundamental existential questions: *"Who am I?"* and *"Where did I come from?*

Sensor

The sensor for this model is self-reflection and self-accountability (*muhasabah)*. It is a command from Allah to engage in *muhasabah* (Qur'an, 59:18). It involves reflecting on one's actions, intentions, and beliefs, and holding oneself accountable for any mistakes or shortcomings. This practice is rooted that every individual will be held accountable for their deeds in the afterlife (Jami' at-Tirmidhi, n.d., Hadith 2459). In the context of human existence, *muhasabah* entails a reflective review of one's daily actions, thoughts, and motivations to ensure they are consistent with the dual role of humans as servants of Allah and vicegerents on Earth as revealed in the Qur'an and Sunnah. Any shortcomings must be addressed through seeking forgiveness (*istighfar*), committing to personal improvement (*tazkiyah*), and striving to perform righteous deed (*amal salih*). Engaging in *muhasabah* regularly is crucial for Muslims as it helps them stay on the path of Allah and attain the ultimate destination of paradise.

Disturbances

The model identifies desires (*nafs*), devil (*shaytan*), and environment as disturbance elements. These are obstacles that can divert individuals who lack of divine guidance to fulfill the role of a true servant of Allah and to carry out the responsibilities of a vicegerent on Earth.

The Qur'an warns that following one's *nafs* can lead to deviation from the intended purpose of human existence. These include committing injustice (Qur'an, 4:135), straying from divine guidance (Qur'an, 38:26), and associating partners with Allah (shirk) (Qur'an, 25:43).

The *Qur'an* also repeatedly warns that *shaytan* is a clear and persistent enemy to humankind (Qur'an 2:208, 6:142). Human are more likely to be misled by *shaytan* when they ignore the Qur'an, which is Allah's guidance (Qur'an 43:36). Shaytan deceives by by instilling false hopes and inflaming desires, leading individuals to make harmful and misguided choices (Qur'an 4:120).

Additionally, environment also can have a significant impact on a person's faith. The environment in which a person is raised or lives can shape their beliefs, values, and behavior. Environment includes family, friends and community. A negative environment that is unsupportive or contrary to Islamic values and beliefs can weaken a person's faith and make it more difficult to practice Islam. The Prophet once reminds the Muslims to choose good friends (Jami' At Tirmidhi, n.d., Hadith 2378) as friendship creates the environment.

Instructional Method

The proposed model was presented to Semester 5 students enrolled in the Control Systems course for the March–August 2025 semester (20252) at the Faculty of Electrical Engineering, UiTM Cawangan Pulau Pinang. A lecture-based method was used to introduce the model as an additional example of a closed-loop control system. During the lecture, the instructor may select any of the preselected verses included in the model, based on suitability and available time. Students are given the opportunity to recite and read translations of the selected verses. This step is intended to inspire students and encourage them to engage with the Qur'an and Sunnah, which are the primary sources of knowledge for Muslims. Additionally, instructors may guide students on how to utilize Islamic apps and websites to support independent learning beyond the classroom. Examples of such resources include Noble Qur'an and Sunnah.com.

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Survey Questionare

A survey was conducted to assess the students' understanding of Islamic teachings related to the proposed model. Data was collected via Google Forms. Participation was voluntary, and responses were kept anonymous to ensure ethical standards. A total of 69 students were involved in the survey. The students are required to complete the survey twice: once before and once after the model is introduced and explained. The questionnaire used in the survey was self-developed to measure the students' understanding on the Islamic teaching described based on the model. A pilot test was conducted to the Semester 5 students enrolled during October 2024-February 2025 (20244) with a smaller group of respondents (n = 15) to evaluate the clarity and reliability of the questions. Minor adjustments were made accordingly before the final administration.

The survey comprises ten (10) questions as presented in Table 2. Each question is rated on a scale from 0 to 10, where 0 indicates no understanding or not important at all, and 10 signifies excellent understanding or absolutely essential, depending on the context of the question.

Table 2: List of Pre- and Post-Survey Questions.

No	Questions
1	On a scale from 0 to 10, rate your understanding about the purpose of your creation (as servant), according to Islamic teachings?
2	On a scale from 0 to 10, how clear are you about the purpose of your existence on earth (as vicegerent), according to Islamic teachings?
3	On a scale from 0 to 10, rate your understanding on how you should live in this world, according to Islamic teachings?
4	On a scale from 0 to 10, rate your understanding about human origin, according to Islamic teachings?
5	On a scale from 0 to 10, rate your understanding about human elements (*ruh* and *jasad*), according to Islamic teachings?
6	On a scale from 0 to 10, rate your understanding about what happens afterlife according to Islamic beliefs?
7	On a scale from 0 to 10, how well do you understand the purpose and function of the Al-Qur'an and Sunnah as a Muslim Engineer?
8	On a scale from 0 to 10, how important it is to you to *tadabbur* (contemplate) the message of the Al-Qur'an as a Muslim Engineer
9	On a scale from 0 to 10, how important it is the process of *muhasabah* (self-reflection and self-accountability) as a Muslim?
10	On a scale from 0 to 10, how important it is the understanding and implementation of AQ teaching in life guarantees the sustainability in terms personal life, society, environment, development, peace and justice on this world?

Results and Discussion

Table 3 shows the analysis obtained form Pre- and Post-survey. The scores shown in Table 3 represent the percentage of the total number of responses rated as 8, 9, or 10. Rating above 8 is selected indicating good understanding on the related topics. Overall, the "Post" scores are consistently higher across all 10 questions, indicating a positive impact of the model on participants' understanding. Most items show significant gain of around 20 to 40 percentage points, suggesting a significant gain in perceived understanding.

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Questions 1 and 2 are aligned with the model's input elements focusing on human purpose and responsibility. The first question focuses on the purpose of creation, which in Islam is to worship Allah. The second question emphasizes the purpose of existence on Earth, which includes serving as Allah's vicegerents, maintaining justice, and caring for the world. Together, these questions evaluate clarity in answering the core question: "Why am I here?" according to Islamic teachings. The model led to an increase of nearly 30% in responses rated above 8, reflecting a substantial improvement in understanding and clarity of this divine purpose from an Islamic perspective.

Table 3: Pre- and Post-Model Evaluation of Participants' Comprehension of Islamic Concepts.

Question	Topic	Pre (%)	Post (%)	Difference (%)
1	Purpose of creation	52.9	82.8	+29.9
2	Purpose of existence on earth	60.3	88.0	+27.7
3	How to live in the world	63.3	87.9	+24.6
4	Human origin	52.9	82.8	+29.9
5	Human elements (*ruh* and *jasad*)	45.6	86.2	+40.6
6	Afterlife	75.0	88.0	+13.0
7	Qur'an & Sunnah for Engineers	54.5	87.9	+33.4
8	Tadabbur (Reflection on Qur'an)	63.2	84.5	+21.3
9	Muhasabah (Self-reflection)	79.4	87.9	+8.5
10	Al-Qur'an role in humans' life and preserving earth's sustainability.	77.9	89.7	+11.8

Question 3 assesses students' understanding of how to live according to Islamic teachings. This question relates to the "process" or *ibadah* element of the model, which connects beliefs to actions in addressing the question, "How should I live?" The 24.6% improvement in scores for Question 3 suggests that the model was effective in enhancing students' understanding of how to translate Islamic principles into practical guidance for everyday life. It also indicates that the model deepened their understanding that the concept of *ibadah* in Islam is not limited to rituals, but encompasses a holistic way of life.

Questions 4 and 5 focus on the understanding of human origin and the elements of human nature; *ruh* and *jasad* , from an Islamic perspective, respectively. These questions relate to the actuator in the system model, which function to translate the internal state of *iman* into *ibadah*. The significant increases in understanding of 29.9% for Question 4 indicates that the model has improved students' understanding on human origin as mentioned in the Qu'ran. Referring to Question 5, the pre-survey score was the lowest at 45.6%, indicating a limited understanding of the concept of ruh (soul) and jasad (body) to perform ibadah consistently to strengthen the relationship with Allah. Exposure to the model significantly increased students' understanding, with the post-survey score rising to 86.2%. This realization encourages students to nurture both components (*ruh* and *jasad*), enabling them to act consciously as Allah's servant and vicegerents (*khalifah*) on earth. These questions address the following fundamental questions: "Who am I?" and "Where did I come from?"

Questions 7 and 8 correspond to the *controller* in the system model, representing the main sources of Islamic knowledge the *Qur'an* and *Sunnah*. Question 7, which focuses on understanding the role of the *Qur'an* and *Sunnah* in the life of a Muslim engineer, showed a

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significant improvement of 33.4%, indicating that the model effectively enhanced students' understanding on the importance of the Qur'an and Sunnah to their life. Question 8, which addresses the importance of reflecting on the *Qur'an (Tadabbur),* shows a pre-survey score of 63.2%, indicating an insufficient appreciation of the process. However, after the introduction of the model, students demonstrated a greater appreciation, with a 21.3% gain in the post-survey score. Since knowledge of the *Qur'an* and *Sunnah* guides Muslims in all aspects of life, including work, they are well-suited to serve as the 'controller' in this model, shaping how Muslims live and worship.

Question 9 highlights the sensor element of the model, which corresponds to the Islamic practice of *muhasabah*. The pre-survey score is notably high at 79.4%, indicating the students' awareness of the importance of *muhasabah*. The increase in the post-survey scores indicates that the model effectively deepened students' understanding of *muhasabah* as a crucial aspect of both spiritual growth and personal development. The findings reflect a heightened awareness among students about the importance of regularly assessing their thoughts, actions, and intentions to remain aligned with Islamic principles.

Finally, Questions 6 and 10 relate to the output component of the system model. Question 10 specifically focuses on the impact of understanding the Qur'an and Sunnah as sources of guidance for fulfilling the dual role of being Allah's servant and vicegerent on Earth. The high pre-survey scores suggest that many students already possessed a foundational awareness of the Qur'an's significance in guiding them to become devout servants and responsible vicegerents of Allah. Nevertheless, the post-survey scores still show an 11.8% improvement, indicating that the model helped deepen their understanding of these divine roles. Being a responsible vicegerent of Allah contributes to the sustainability of the Earth, including caring for the environment, using resources responsibly, and fostering peace, justice and harmony in society.

Meanwhile, Question 6 evaluates students' understanding of the concept of the afterlife from an Islamic perspective. A high pre-survey score of 75% indicates that students already had a good grasp of this concept, which is expected since it is commonly introduced early in a Muslim's upbringing. However, with the introduction of the model, this understanding improved to 88%. This notable gain suggests that the model effectively clarified key concepts related to the Islamic view of the afterlife. The improvement indicates that students became more aware of the significance of accountability, divine justice, and the consequences of one's actions in the hereafter. Faith in the afterlife is essential, as it serves as a motivating force for living as obedient servants and responsible vicegerents of Allah, which is the desired target of this model.

Overall, the significant increase in the post-survey score suggests that the proposed model able to deepen student understanding on the meaning of human existence through the lens of closed-loop control system. The question of "Why am I here?" is addressed in the input of the model where human beings are created to worship Allah and to be the vicegerent of Allah on earth. The questions "Who am I?" and "Where did I come from?" are explained in the actuator part of the model which are the *ruh* and *jasad*. The question, "How should I live?" is elucidated in the process part of the model where humans should consider every aspect of life as *ibadah* without limiting it to religious ritual. More importantly, human needs to refer to the Qur'an and Sunnah as guidance in navigating their life according to Allah's will. Lastly, the question of "Where am I going?" is answered in the output section of the model. By adhering to the Qur'an

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and Sunnah, individual is able to become devout servant and responsible vicegerent in managing the earth. This ultimately leads to favourable outcome in the Hereafter, namely the reward of paradise. This model helps align the Muslim mindset towards the recognition of God, in line with the ultimate aim of the Islamization of education to cultivate morally upright individuals who acknowledge and submit to the Creator (Al-Attas, M. N., 1980).

In the context of a closed-loop control system, the controller plays a crucial role in ensuring that the output follows the desired response, regardless of the presence of disturbances. An incorrect selection or improper setting of the controller can lead to an uncontrolled situation or, in the worst case, system instability. Following this principle, the Qur'an and Sunnah are designated as the controller in the proposed model, as they represent the final, preserved guidance (Qur'an, 15:9) provided by Allah to humankind (Qur'an, 2:185). Just as a controller continuously monitors and adjusts a system's output to align with the desired input, the Qur'an and Sunnah offer continuous spiritual guidance and corrective direction to ensure that a Muslim's actions remain aligned with the will of Allah. Without this divine guidance, a believer may easily stray from the intended path just as a control system would fail to maintain stability or accuracy without a properly functioning controller. In addition to serving as the controller in the proposed model, it is crucial that every component of the model is also defined and structured according to the framework of the Qur'an and Sunnah, as this divine guidance is the most suitable for shaping every aspect of human life, both individually and collectively in society. The analogy between a controller and revealed knowledge helps Muslim engineering students understand the significance of the Qur'an and Sunnah as essential sources of daily guidance. This realization is crucial in fostering a deeper and more meaningful connection with revealed knowledge. The proposed integration aligns with the idea put forward by Taha Jabir al-Alwani, which emphasizes the methodological organization of science and its principles, rather than merely grafting revealed knowledge onto existing frameworks (Al-Alwani, T. J., 1995).

During the delivery of the model to students, reciting Qur'anic verses and reading the translation while reflecting on the fundamental questions of human existence induced contemplation (*tadabbur*) of the Qur'an. This process enhanced students' understanding of the elements of human existence presented in the model. The increased comprehension is evident from the improved post-survey scores across all questions. These results highlight the importance and impact of revealed knowledge in guiding them toward a clearer awareness of their purpose in life. Eventually, this approach could potentially nurture future Muslim engineers who not only possess strong technical expertise but also understand their divine roles as devoted servants and responsible vicegerents committed to upholding justice and caring for the world.

Additionally, the model provides an innovation in the delivery of engineering concept using Islamic content to support Islamization of engineering education (Idris, F, 2025). The model creates opportunities for Muslim engineering educators who teach Control Systems to impart Islamic teachings alongside technical knowledge. Currently, it is quite challenging to incorporate Islamic teachings in engineering education as there are limited Islamic-engineering teaching materials available. While these approaches can be highly beneficial for Muslim students, it is equally important for instructors to exercise wisdom and sensitivity when conveying Quranic messages and hadith, particularly in classes that include non-Muslim students. The content should be presented in a respectful and inclusive manner, without

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imposing beliefs or disregarding the perspectives of others, as improper delivery may lead to discomfort and disrupt classroom harmony.

Conclusion

A block diagram model of the meaning of human existence is proposed and presented in this paper. It is a model adopted from Control System Theory a subject taught to engineering students. It is infused with Islamic values and teaching from The Qur'an and Sunnah, as an effort to integrate engineering education with the revealed knowledge. The integration produces an Islamic-based material for engineering education to support the implementation of Islamization of education. Using control systems terminologies, this model aids students in comprehending the true purpose of life as emphasized in the book of guidance, the Qur'an. Furthermore, it highlights the significance of revealed knowledge in guiding humanity to fulfill its responsibility as Allah's vicegerent in preserving the sustainability of the Earth.

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