Journal of Educational Analytics (JEDA)
Vol. 3, No. 4, 2024 : 545 - 558

The Contribution of Integrative Physics Textbooks in Higher Education and Their Impact on Islamic Education Goals

Dadi Cahyadi[1]*, Budi Handrianto[2]
Postgraduate Programme, Ibn Khaldun University, Bogor, Indonesia
Corresponding Author: Dadi Cahyadi dadicahyadi_dpai@uika-bogor.ac.id

A R T I C L E I N F O

Keywords: Islamic Education, Integrative, Physics Textbook

Received : 14, October
Revised : 26, October
Accepted: 25, November

A B S T R A C T

This study examines the dominance of the modern scientific perspective in university science education, which often separates natural sciences from faith-based values. To bridge this gap, developing Physics textbooks that integrate a faith-based approach is crucial. The research explores how Physics textbooks can contribute to achieving Islamic educational goals in universities, employing a qualitative method including literature reviews and textbook analysis. The findings reveal that integrative Physics textbooks can significantly contribute to linking Physics concepts with Islamic values, creating a holistic learning approach. This study proposes a concept for integrative Physics teaching materials, incorporating the history of science and the philosophy of science, preparing students to master Physics and develop strong faith.

INTRODUCTION

Richard Feynman stated that Physics is the most fundamental science, encompassing all branches of knowledge and significantly influencing scientific development. In fact, Physics is equivalent to what was once called natural philosophy, the origin of much of modern science [Feynman, 2010]. Ian Graeme Barbour highlighted the critical role of Physics in modern science, describing it as the study of matter and energy's fundamental structures and transformations at their lowest levels of organisation, using abstract equations. While seemingly distant from religious issues related to human life, Physics holds great historical and contemporary significance. As the first systematic and precise science, Physics' assumptions have been adopted by other disciplines, profoundly impacting philosophy and theology. Physicists now explore various objects, from quarks to galaxies, including life's fundamental processes. Without quantum physical forces, we would lack chemical elements, the periodic table, transistors, nuclear energy, or life [Barbour, 2000]. Records of ancient civilisations, such as Egypt, Mesopotamia, and Greece, indicate that Physics, rooted in observing celestial movements, is the oldest science [Perry, 2011].

Thus, Physics is a foundational science crucial for developing technology beneficial to the Muslim community. Given the current global positioning of most Muslim nations as technology users rather than creators, mastering Physics as a foundational science is essential for advancing scientific and technological capabilities. This mastery could lead to the development of indigenous technologies that benefit Muslims and enhance their global competitiveness. For Indonesia, a nation known for its strong religious values, preparing for global challenges includes emphasising natural science education. Science education is crucial for Indonesia in the context of global competition and religious strength. As the basis for technological and innovative progress, science plays a vital role in building the nation's competence in the international arena. Therefore, for Indonesia's religious society, science education integrated with faith values is both meaningful and urgent. Current Physics textbooks for higher education, such as Physics: Principles with Applications by Giancoli, present fundamental challenges. These textbooks adhere to a modern scientific perspective, interpreting nature as an independent reality unrelated to spirituality, rooted in positivist paradigms. Modern science, born of Western civilisation, adopts a distinct worldview. According to Leopold Weiss, Western civilisation's primary characteristic is the exclusion of religion (God), viewing the universe through secular lenses, often resulting in environmental degradation [Weiss, 2015]. Consequently, Giancoli's book remains fragmented, addressing scientific objects empirically and physically without integrating broader perspectives.

On the other hand, the primary goal of higher education is to develop students' potential to become individuals of faith, virtue, knowledge, skills, creativity, independence, competence, and culture for national benefit. This aligns with Islamic educational objectives, which aim to produce virtuous individuals. Collectively, this leads to the formation of a virtuous society, exemplified by the Madani society of Medina during Prophet Muhammad's

time [Tafsir, 2020]. Thus, a gap exists between higher education Physics content, which focuses solely on empirical-rational aspects, and Islamic education goals, which include material and spiritual dimensions.

Addressing this gap involves a strategic effort to provide and teach science education, specifically Physics, at the university level by incorporating spiritual and ethical aspects. This approach is essential for nurturing future national leaders and forms the basis for creating an integrative Physics textbook for first-year university students.

Based on this background, the following research questions arise: How can a Physics textbook contribute to integrating Physics concepts with Islamic values to achieve Islamic education goals in universities? What are the essential elements required to develop an integrative Physics textbook that is relevant and effective in supporting the attainment of Islamic educational objectives in higher education?

LITERATURE REVIEW

The Relationship between Science and Religion

The discourse on the relationship between science and religion in the West has become increasingly vibrant over recent decades. This is partly driven by the growing environmental degradation across various parts of the world, attributed to the large-scale exploitation of nature through the unrestrained use of modern science and technology. Modern Western humans, influenced by Francis Bacon's philosophy that "science is power, used by humans to manage nature for the greatest benefit of humanity," have ultimately neglected the proper way of treating nature [Russell, 2004]. Nature is being exploited massively, based on the principle of utility, solely for immediate and localised interests. As a result, some Western scientists have begun emphasising the need to return to values that should guide scientific activities. These values ensure that science and technology are beneficial, non-destructive, and harmonious with the universe. These guiding values, primarily and most importantly, can be derived from religious teachings, which encompass ethical and moral concepts to direct humanity towards a harmonious relationship with God, humanity, and nature.

Francis Bacon is renowned as a philosopher who, alongside René Descartes, is considered a foundational figure in establishing the principles of the scientific method. Bacon is known for his inductive approach, while Descartes is recognised for his deductive reasoning. Together, their ideas laid the groundwork for modern Western scientists in conducting research and observing the natural world. Often referred to as "Prophets of Modern Science," Bacon and Descartes played pivotal roles in articulating the implications of the Scientific Revolution. They formulated new investigative methods and advocated for the utility of science for humanity, rejecting the authority of Aristotle and other ancient figures in favour of innovative approaches to uncovering and assessing truth. Marvin Perry describes Bacon as an English statesman and philosopher (1561–1626) who championed scientific progress and the scientific method, despite not conducting experiments or making discoveries himself. Bacon argued that knowledge should be harnessed to

exploit nature for human advancement, improving life through commerce, industry, and agriculture. Advocating the principle that "knowledge is power," he encouraged states to establish scientific institutions. He also emphasised the contributions of craftsmen, mechanics, and engineers to human progress and welfare, valuing their practical roles over theoretical philosophers and theologians [Perry, 2011].

The Scientific Revolution fundamentally altered the medieval understanding of the universe, introducing the scientific method—rigorous and systematic observation and experimentation—as the key means to uncover nature's mysteries. Western scientists increasingly conceived of nature as a mechanical system governed by mathematically expressible laws. These groundbreaking discoveries captivated the imagination and elevated science as the dominant source of knowledge, replacing theology. Reason, which had been subordinate to religion in the medieval period, asserted its independence. The Scientific Revolution's confidence in reason gave rise to the Enlightenment, which explicitly rejected medieval ideas and institutions, such as the church and religion, while establishing the core principles of modernity. This redefinition of the physical universe profoundly reshaped humanity's understanding of individuals, society, and life's purpose, positioning the Scientific Revolution as a pivotal factor in shaping the modern world. Medieval cosmology depicted a geocentric universe, with heaven situated just beyond the stars and all objects arranged hierarchically. The Scientific Revolution overturned this view, proposing a homogeneous universe of infinite space filled with innumerable celestial bodies. The boundary between heaven and earth dissolved as the heavens lost their perceived grandeur, now seen as composed of the same materials and governed by the same laws as earthly objects. The medieval notion that God assigned ultimate purposes to natural entities and that everything had a predetermined role within His divine plan was dismissed. Modern science rejected teleology, focusing instead on the physical properties of matter, mathematical principles, and chemical composition [Huff, 2003].

The Modern era in science is typically regarded as beginning in 1543, when Nicolaus Copernicus published his book De Revolutionibus ("Revolutions"). This work introduced the heliocentric theory, which proposed that the planets orbit the Sun rather than the Earth. This perspective overturned the Medieval paradigm, which placed Earth and humanity at the centre of the universe (geocentrism). This shift caused significant upheaval in science, intellectual thought, and theology, as the Church had adhered to Ptolemy's ancient geocentric theory. Bertrand Russell identified two key characteristics of the Modern age in Western civilisation: the decline of Church authority and the rise of scientific authority. These changes, rooted in the 14th-century Renaissance, inspired the development of Modern science [Russell, 2004].

The concept of religion in this study aligns with Syed Muhammad Naquib Al-Attas's explanation. In his book Risalah untuk Kaum Muslimin, Al-Attas outlines three definitions of religion: first, religion is based on divine revelation from the True God to humanity through His messengers or prophets; second,

religion is a collection of superstitious beliefs, including prescribed forms of worship or servitude; third, religion consists of opinions and laws formulated by wise philosophers and intellectuals for societal welfare and harmony. Al-Attas further clarifies that the first definition is upheld by those who believe in the truth of religion, the second by those who deny its truth, and the third by those indifferent to religion unless it serves as a tool of the state. Modern Western civilisation predominantly understands religion through the lens of the second and third definitions [Al-Attas, 2001].

Islamic Education

Discussions about education will always remain relevant throughout human life. Education serves as one of the key pillars for a nation's progress, as it is through education that human resources are developed, ultimately determining the advancement or decline of a nation. Wan Mohd Nor Wan Daud, in his book, explains that the global education system, in relation to its objectives, is generally divided into two categories. First, the societal-oriented approach views education as a primary means of shaping good citizens for governance, regardless of the nation's system or structure. Second, the individual-oriented approach focuses on students' interests, intellectual development, and emotional balance. Wan Daud further notes that most countries today predominantly adopt the societal-oriented education system [Wan Daud, 2003].

In his book Curriculum Planning: A Handbook for Professionals, David Pratt explains that those who advocate for an education system focused on society include the Perennialist tradition, often associated with Plato, medieval Western scholars, and modern thinkers such as Jürgen Habermas, Paulo Freire, George S. Counts, William T. Harris, Robert Hutchins, and Adler, as well as feminists who passionately promote the principles of freedom [Pratt, 1994]. Meanwhile, almost all of the world's major religions subscribe to an individual-centred view of education [Wan Daud, 2003].

In the context of Indonesia, education has been officially defined and is stated in the Preamble of the Constitution of the Republic of Indonesia as part of the nation's objectives. The goals of the Republic of Indonesia are outlined in the fourth paragraph of the 1945 Constitution, which are: to protect all the people of Indonesia and the entire territory of Indonesia; to promote the general welfare; to educate the nation's life; and to contribute to world order based on independence, eternal peace, and social justice. This demonstrates that the nation's founders understood and recognised the significance and urgency of education for the continuity and advancement of the nation, reflected in the phrase "to educate the nation's life" as one of the purposes of establishing the Republic of Indonesia. In the Higher Education Law, education is defined as a deliberate and planned effort to create a learning environment and process that enables students to actively develop their potential, so they possess spiritual strength, self-control, character, intelligence, good morals, and skills necessary for themselves, society, the nation, and the state [UU No.12/2012].

Higher education is a crucial stage in shaping the character and intellect of students. In the context of Islamic education, learning aims not only at the

transfer of knowledge but also at the development of morals and spirituality in line with Islamic values. Hasan Langgulung states that the objectives of education in Islam can be divided into ultimate, general, and specific goals. The ultimate goal of Islamic education refers to an absolute, unchanging, and universal aim: the formation of a insan kamil or a perfect human being. Furthermore, Hasan explains that the general objectives of Islamic education are: first, the development of noble character; second, preparation for life in both this world and the Hereafter; third, preparation for earning a livelihood and ensuring its beneficial aspects; fourth, fostering a spirit of seeking knowledge; and fifth, preparing individuals professionally and technically for their future. The specific goals of Islamic education, according to Hasan, include introducing the younger generation to Islamic beliefs, noble ethics, a strong faith in Allah S.W.T. and the pillars of faith, as well as educating them about immoral actions to encourage them to avoid such deeds and refrain from doing things prohibited by Allah S.W.T. [Langgulung, 2003].

According to Syed Muhammad Naquib Al-Attas, the goal of Islamic education is the cultivation of adab (ta'dib) in students. The structure of this concept of ta'dib encompasses the elements of knowledge ('ilm), instruction (ta'lim), and proper development (tarbiyyah). Al-Attas emphasises that the objective of education should not be to produce a perfect citizen, but rather to bring forth a complete human being (insan kamil). The ultimate goal of Islamic education is to nurture virtuous individuals [Al-Attas, 1979]. A good person is one who is fully aware of their responsibilities towards their Creator, who understands and upholds justice towards themselves and others in society, and who continuously strives to improve every aspect of their being in pursuit of perfection as a civilised human being [Putri, 2023].

Textbooks in Higher Education

University textbooks are written instructional materials designed as primary learning resources in higher education settings. These textbooks aim to address the educational needs of students across various academic programmes, providing an in-depth understanding of specific disciplines [Pedoman Publikasi Ilmiah, 2017]. Typically, they contain content derived from recent research and relevant theories, offering a comprehensive exploration of the subject matter. Moreover, university textbooks are usually well-structured, starting with fundamental concepts before progressing to more complex topics. This organisation allows students to gradually develop their understanding. They are written in formal, academic language and often incorporate specialised terminology pertinent to particular fields of study, ensuring clarity and relevance for advanced learners.

To clarify theoretical concepts, this textbook will include case examples, case studies, and practical applications relevant to real-world contexts. It will also feature practice exercises, discussion questions, and assignments designed to assess students' understanding while encouraging critical and analytical thinking. Equally important, the textbook will provide a bibliography and additional references to broaden students' knowledge and offer further reading materials. In this way, it can be concluded that a university textbook serves as a

vital tool in supporting the teaching and learning process, aiding students in achieving the competencies required within their academic programmes.

On the other hand, a textbook is a book containing teaching materials aligned with the current curriculum, serving as foundational knowledge and a learning tool for both classroom instruction and independent study. In this sense, a textbook acts as a companion for students, supporting their self-directed learning. The primary audience for textbooks is students, and they are specifically designed to address students' learning challenges. Given the distinct roles of reference books and textbooks, it is appropriate for regulations to require lecturers to produce textbooks. Such materials significantly aid students in deepening their understanding of classroom lessons or pursuing independent study [Kep Dirjen Dikti, 2021].

Textbooks are closely linked to students and serve as primary teaching materials, typically designed for use over a semester or, at most, a year. University-level textbooks must adhere to specific established criteria. These include: first, the content must align with the author's academic field and be based on original research or thought; second, they should be published by recognised entities, such as scientific bodies, organisations, or universities, through an editorial process that ensures scientific accuracy and proper language usage; third, they must have an International Standard Book Number (ISBN); and fourth, they should contain at least 40 printed pages, following UNESCO's formatting standards [Pedoman Publikasi Ilmiah, 2017].

Mirnawati, in her research, highlights a significant disparity between the number of textbooks and the number of lecturers in Indonesia. Data from 2021 indicates there were 1,674 textbook titles compared to 296,040 lecturers. This suggests that with only 1,674 textbooks published, 295,363 lecturers have yet to produce one. Assuming each lecturer authored a single textbook, the current output represents just 0.5% of the total, reflecting a very low proportion [Mirnawati, 2022]. Furthermore, the obligation for lecturers to produce textbooks is explicitly outlined in the Operational Guidelines for Lecturer Workloads (PO BKD), which state that lecturers, individually or collaboratively, are required to create textbooks or instructional materials. This is not only to serve as learning resources and foster academic culture but also to promote reading and writing within the academic community [Kep Dirjen Dikti, 2021]. Therefore, each lecturer should ideally produce a textbook for the course they teach, fulfilling both their professional duty and contributing to a healthy academic culture.

METHODOLOGY

This research employs a qualitative method using a literature study approach, complemented by additional data from a limited student survey. This approach aims to gain an in-depth understanding of the topic by combining theoretical analysis from existing literature with students' perceptions of the relationship between science and religion. It emphasises the meanings, experiences, and perspectives of the research subjects, allowing for deeper insights into the issue, which may not be fully revealed through quantitative data.

For data collection, methods such as document and literature analysis (relevant written sources) were utilised, supported by a student survey. The literature analysis began with a review of previous studies related to Physics textbooks and their connection to the objectives of Islamic education at the university level. The aim was to understand the approaches used in prior research.

Subsequently, a literature review was conducted by gathering and analysing various written sources relevant to the research topic. These sources included books, journal articles, research reports, dissertations, and other publications to uncover theories and concepts supporting the research framework and data interpretation from an academic perspective.

For data analysis, the process involved reviewing, synthesising, categorising, and interpreting information related to the relationship between science-physics and religion. This served as an inspiration for developing an integrative Physics textbook concept for use in university Physics courses. Thus, the research method in this dissertation combines literature studies with surveys as supporting data, which collectively fall within the qualitative approach.

RESEARCH RESULT AND DISCUSSION

The Concept of Physics Textbooks that can Contribute to the Goals of Islamic Education

Globalisation in the 21st century has rapidly reached every corner of the world, having a significant impact on various aspects of human life. As part of the global community, Indonesia has also been influenced by these changes, particularly in the field of education. At the higher education level, one of the key subjects is Physics, especially for programmes related to natural sciences, engineering, and technology, which play a crucial role in equipping students with the fundamental knowledge required to solve problems in the field of engineering.

Physics in Higher Education

The content of the Physics course taught in the first semester of the Industrial Engineering programme begins with the topic of motion and ends with static equilibrium. The topics, in sequence, are as follows: Topic 1 – Introduction, Measurement, Estimating; Topic 2 – Describing Motion: Kinematics in One Dimension; Topic 3 – Kinematics in Two Dimensions & Vectors; Topic 4 – Dynamics: Newton's Laws of Motion; Topic 5 – Circular Motion; Gravitation; Topic 6 – Work and Energy; Topic 7 – Linear Momentum; Topic 8 – Rotational Motion; and Topic 9 – Static Equilibrium; Elasticity & Fracture [Gaincoli, 2014]. The following are some examples of topics that may be found – though not all – in the reference book.

The topic, "Describing Motion: Kinematics in One Dimension," sees Giancoli discussing mechanics, the study of the motion of objects, alongside concepts of force and energy. He introduces prominent scientists such as Galileo and Newton, who made significant contributions to the modern understanding of motion in the 16th and 17th centuries. Mechanics is divided

into kinematics, which examines the motion of objects, and dynamics, which explores the forces that cause motion. This topic focuses on the motion of objects along a straight path, or one-dimensional motion, and covers concepts such as reference frames, position, displacement, velocity, and acceleration [Giancoli, 2014].

In the topic of "Circular Motion, Gravitation", Giancoli explains the concept of circular motion and its application to Newton's laws. Newton used this concept to understand the motion of the Moon and planets, leading to the formulation of the law of universal gravitation. In uniform circular motion, the speed of the object remains constant, but its direction of motion changes, causing the object to experience acceleration even though its speed is unchanged. This acceleration is known as centripetal or radial acceleration, which always points towards the centre of the circle. Newton stated that the acceleration of an object in circular motion is always directed towards the centre of the circle [Giancoli, 2014].

In the topic of "Work and Energy", Giancoli presents an alternative approach using the concepts of energy and momentum. Work, defined as the product of a force acting on an object and moving it, is considered as translational motion. Work done on an object by a constant force (whether in magnitude or direction) is defined as the product of the displacement magnitude and the force component parallel to the displacement. Giancoli then discusses energy, one of the most fundamental concepts in science. A key aspect of energy is that the total amount of all types of energy remains unchanged after any process: in other words, energy is a conserved quantity. Energy is traditionally defined as "the capacity to do work". By paying attention to the discussion of topics in the book Physics – Principles With Applications by Giancoli above, it can be said that the book does not yet contain content that contains a discussion that links the teaching of physics material with the instillation of values of faith in ALLAH SWT, because the object of study is solely based on the positivist paradigm.

Furthermore, in order to obtain initial information, a preliminary survey was conducted to determine students' views on the relationship between Science-Physics and Religion, as well as whether after studying Physics they can feel an increase in faith in God Almighty. In this initial survey, conducted at the end of July 2023, even semester 2022/2023, by taking samples from 2 classes, with a total of 51 students as respondents, which is the population of the regular class R-2. The complete results of the survey are in the appendix..

In the survey question "In your opinion (as a student who adheres to a certain religion), is there a relationship between Science and Religion?", 34 students answered yes, 6 said no, 10 were unsure, and 1 student answered don't know. In the survey question "In your opinion, the right relationship between Science and Religion is: a) Science and Religion are contradictory; b) Science and Religion are equally valid, but separate from each other; c) Science and Religion, although different, can dialogue with each other; d) Science and Religion can partner and strengthen each other?", there were 4 students who answered conflict, 13 answered independence, 16 answered dialogue, and 18

students answered integration. In the survey question "After studying Science-Physics on campus, do you feel that your faith in God has increased?", there were 12 yes answers, 20 no answers, and 19 undecided answers.

Thus, in general, the picture of student perceptions is taken from 4th semester students, who have taken Physics courses in their first year of college. From the initial survey, it was shown that the students who were respondents showed a positive understanding that there is a relationship between Physics and Religion, however, the survey results showed that most respondents felt that their faith did not increase after studying Physics. This survey is of course still too small for the number of respondents, so of course it would be better if the number of respondents was increased. In the context of Physics courses in college, a Physics textbook can be compiled that can provide value instillation in accordance with the Islamic perspective, so that students are expected to view natural phenomena as verses of Allah SWT, so that they become good and civilized students. A textbook is a reference book that will be used by lecturers and their students in a particular field of science, with materials compiled based on the government curriculum and can be supplemented with explanations and Islamic perspectives on science. Therefore, it can be said that it is a strategic step to provide and teach science education materials in this context, Physics at the college level by including and adding aspects of spirituality-ethics to students, as future leaders of the nation.

Integrative Physics Textbooks in Higher Education

An integrative Physics textbook for higher education refers to a textbook or learning material specifically designed for teaching Physics at the university level, adopting an approach that goes beyond focusing solely on scientific Physics concepts. Instead, it connects these concepts with faith-based values and spirituality.

The purpose of such a textbook is to provide students with a more comprehensive understanding, enabling them not only to master Physics theories and principles scientifically but also to appreciate how this knowledge can be linked to faith and relevant moral or spiritual values.

This approach seeks to bridge natural science (Physics) with religious views or principles, fostering an integration of science and faith that promotes harmony in students' understanding. The textbook may incorporate perspectives from the philosophy of science, such as epistemology, ontology, and axiology, to enrich understanding and strengthen the spiritual dimension while also discussing the history of science. Thus, the integrative Physics textbook serves not only as a scientific resource but also as a character-building tool, preparing students to become scientists who are not only technically proficient but also grounded in strong ethical and faith-based principles.

Important Elements in Integrative Physics Textbooks

History of Science

By incorporating the history of science into integrative Physics textbooks based on a faith-based approach, industrial engineering students can gain a more holistic understanding of science, appreciate the connection between knowledge and faith, and develop a moral-spiritual foundation for their scientific practice. The urgency of studying the history of science within a faith-based approach to Physics for Industrial Engineering students can be outlined as follows: First, it fosters an understanding of the context and development of scientific knowledge. Learning about the history of science helps students grasp the circumstances in which physical theories and concepts were developed. This provides insight into how human knowledge of the universe has evolved over time.

Second, recognising the contributions of Muslim scientists in the history of science. Faith-based textbooks can highlight the significant roles played by Muslim scientists throughout history. This is crucial, as their contributions are often overlooked in traditional curricula. Third, understanding the connection between science and faith. Exploring the history of science from a faith perspective can help students realise that science and religion are not necessarily in conflict [Nasr, 1989]. Instead, they can complement each other, fostering a deeper understanding of the universe and its Creator. Fourth, avoiding unbalanced materialism and positivism. The history of science can reveal the negative consequences of materialistic and positivist approaches that neglect religious and spiritual dimensions. Students can learn about the risks of separating science from moral and spiritual values.

Philosophy of Islamic Science

The philosophy of science can be understood as a branch of philosophy that specifically examines the nature, methodology, and validity of knowledge. As a discipline, it seeks to address fundamental questions such as: What is science? How is scientific knowledge developed? What criteria determine whether a body of knowledge can be considered scientific? Furthermore, the philosophy of science explores the relationship between science and reality, as well as the ethical and epistemological implications of scientific discoveries. Generally, the philosophy of science encompasses three main areas of study: epistemology, ontology, and axiology. Islamic Philosophy of Science is a branch of philosophy that examines science based on Islamic principles. Its purpose is to understand and develop knowledge grounded in revelation, spiritual values, and Islamic ethics, making it not merely empirical or rational but holistic, encompassing both material and spiritual aspects.

Epistemology in the philosophy of science is a branch of philosophy that examines the sources, justification, and limitations of scientific knowledge. Ontology in the philosophy of science explores the nature or reality of what exists in the universe. Axiology in the philosophy of science examines the values and ethics involved in scientific practice. It encompasses ethical considerations in the research, development, and application of scientific knowledge [Soelaiman, 2019].

The aspects of the philosophy of science for students have benefits which can be summarized in the following table:

Tabel 1. Benefits of the Philosophy of Science Aspect for Students

INTEGRATIVE PHYSICS TEXTBOOK		
No	**Philosophy of Science**	**Usefulness for Students**
1	Epistemology	Exploring sources and methods of knowledge recognized in Islam, so that students are able to appreciate and develop knowledge of physics that is in harmony with religious principles.
2	Ontology	Understanding the nature of reality from an Islamic perspective, which emphasizes that there are material and non-material realities, both of which are creations of Allah SWT.
3	Axiology	Providing spiritual-ethical-moral guidance in the application of physics, so that its use is for the good and benefit of humanity, avoiding the misuse of science that could harm the universe.

CONCLUSIONS AND RECOMMENDATIONS

The research findings can be summarised as follows: First, an integrative Physics textbook can make a significant contribution by linking Physics concepts with Islamic values, thus creating a holistic approach to learning. This integration allows students to not only understand Physics scientifically but also instil faith-based and spiritual values in the learning process. With this approach, the textbook supports the achievement of Islamic educational goals in higher education, namely shaping individuals who excel intellectually, morally, and ethically. This is accomplished through the inclusion of material that introduces the history of science and the philosophy of Islamic science, ultimately strengthening the synergy between scientific knowledge and Islamic objectives in learning.

Second, key elements that should be included in the development of an integrative Physics textbook to support Islamic educational goals in higher education include: the history of science and the philosophy of science, with aspects of epistemology, ontology, and axiology. By integrating these elements, the Physics textbook can become a relevant and effective tool in supporting the achievement of Islamic educational objectives in higher education.

Based on the findings of this research, the following recommendations are proposed to higher education policymakers for Physics course instruction: First, the creation of an integrative Physics textbook should include the addition of historical and philosophical aspects of science. Second, training and development programs for Physics lecturers at universities should focus on integrating faith-based values into Physics teaching

ADVANCED RESEARCH

For future research development, studies could be carried out using an experimental approach or through Research & Development (R&D), focusing

on the advancement of science or the teaching and learning of physics in higher education.

REFERENCES

Al-Attas (2001). Risalah untuk Kaum Muslimin, Kuala Lumpur: ISTAC.

Al-Attas, S.M.N. (1979). Aims and Objectives of Islamic Education. Jeddah: King Abdul Aziz University.

Barbour, I. Graeme (2000). When Science Meets Religion, San Fransisco Publisher.

Feynman, Richard, Robert Leighton, Matthew Sands (2010. The Feynman Lecturer on Physics, New York: California Institute of Technology.

Giancoli, Douglas C. (2014). Physics – Principles with Applications. Glenview: Prentice-Hall.

Huff, Toby E. (2003). The Rise of Early Modern Science, New York: Cambridge University Press.

Keputusan Direktorat Jendral Pendidikan Tinggi Kementerian Pendidikan dan Kebudayaan tentang Pedoman Operasional Beban Kerja Dosen, No. 12/E/KPT/2021, Bab II, poin B.4. Kewajiban Dosen.

Langgulung, Hasan (2003). Asas-asas Pendidikan Islam. Jakarta: Pustaka Al-Husna.

Mirnawati, Mira (2022). "Regulasi Penulisan Buku Ajar bagi Dosen di Perguruan Tinggi". Jurnal Ilmu Pendidikan Nonformal AKSARA, Volume 08, (1), Januari 2022.

Nasr, Seyyed Hossein (1989). Knowledge and The Sacred, New York: State University of New York Press.

Pedoman Publikasi Ilmiah - Kemenristekdikti, 2017.

Perry, Marvin (2011). Western Civilization – A Brief History, Boston: Wadsworth.

Pratt, David (1994). Curriculum Planning: A Handbook for Professionals, Fort Worth: Harcourt Brace College Publisher.

Putri, Nazwa Elifa, dkk., "Makna dan Tujuan Pendidikan menurut Syed Muhammad Naquib Al-Attas". Jurnal Review Pendidikan dan Pengajaran, Volume 6 No.3, 2023.

Russell, Bertrand (2004). History of Western Philosophy. London: Routledge.

Soelaiman, Darwis A. (2019). Filsafat Ilmu Pengetahuan: Perspektif Barat dan Islam, Kota Banda Aceh: Bandar Publishing.

Tafsir, Ahmad Tafsir (2020). Filsafat Pendidikan Islam. Bandung: Remaja Rosdakarya.

Undang-undang No. 12 Tahun 2012 tentang Pendidikan Tinggi.

Wan Daud, Wan Mohd Nor (2003). Filsafat Dan Praktik Pendidikan Islam Syed M. Naquib Al-Attas, Bandung: Mizan.

Weiss, Leopold (2015). Islam Di Simpang Jalan, Bandung: Sega Arsy.