



## Needs Analysis for Developing an Islamic-Integrated Fluid Module

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### ABSTRAK

Module are one of the learning resources that an important role in supporting the success of the learning process and support in delivering material systematically, directed, and in accordance with the established learning outcomes. This study aims to obtain information about the need for integrated science and Islamic Fluid module. This type of research is descriptive qualitative with research subjects of 23 students in Science Education département who have programmed the Fluid course. The data of this study includes an analysis of the need for integrated science and Islamic Fluid module. This research instrument is a questionnaire filled out by students and an interview sheet. The results of the study obtained by the integrated science and Islamic Fluid module scored 83% (category very needed) and the available module are still limited, so the development of integrated science and Islamic Fluid module is very needed.

**Keywords:** Integrated Islamic; Fluid; Module; Analysis of Needs

Received: 27 Nov 2025; Revised: 25 Dec 2025; Accepted: 30 Dec 2025; Available Online: 31 Dec 2025

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### INTRODUCTION

Learning activities at university level foster skills and in-depth understanding to equip students for future employment and careers. Therefore, learning analysis is crucial for innovative learning, fostering student skills development by leveraging technological advancements in the learning process. Effective learning is characterized by student-centered learning, the ability to work independently, and responsibility for achieving learning objectives, as well as developing students' skills (Eliezanatalie & Deta, 2023).

Student-centered learning can be facilitated by module to support independent learning. Module are book of reference for information, knowledge, and learning experiences. Module consist of structured material aligned with the learning process and reflect the skills students are learning. Module serve as guides in the learning process, adapt to students' needs, and can facilitate independent learning, ensure optimal learning and adapt to students' characteristics (Mahbubah, Santoso, & Djatmiko, 2025).

Learning achievement is also influenced by the role of module in the learning process. Therefore, it is important to analyze the need for module that are appropriate to students' needs and characteristics (Husna et al., 2020). Module can be printed or electronic, helping students gain understanding and motivating them to learn. Module present information, materials, scientific knowledge, and learning activities carried out independently by students. Developing module can improve the quality of learning and the orderliness of the learning process, leading to successful learning outcomes in specific courses (Nilyani, 2023)

Higher education plays a strategic role in preparing a generation of intellectuals who not only master science but also possess a solid foundation of values and morals (Engelina Siregar, 2024). In the context of physics learning at universities, science is often taught separately from religious values. This has the potential to create a dichotomy between science and Islamic teachings, even though throughout the history of Islamic civilization, the two have developed harmoniously. Integrating science and Islam in physics learning is crucial to restore a holistic scientific paradigm, one that views natural phenomena not only from an empirical-rational perspective (Kadir, 2023) but also as signs (ayat kauniyah) of Allah SWT's greatness. Thus, students not only understand the laws of physics conceptually and mathematically but also cultivate spiritual awareness, gratitude, and moral responsibility in utilizing knowledge.

The integration of science and Islam in physics learning is one solution to preparing graduates with character, global competitiveness, and adherence to Islamic values (Akbar et al., 2025). Thus, the integration of science and Islam in physics learning at universities is not just an educational innovation, but a strategic need to build a generation of Muslims who are scientific, faithful, and have noble morals.

Higher education has a significant responsibility in preparing students who are not only intellectually intelligent but also possess a strong moral and spiritual foundation (Fuadi & Suyatno, 2020). However, in practice, science learning at the university level, including physics, is often trapped in a dichotomy between science and religion. The dichotomy between science and religion can weaken the meaning of education because students only understand the cognitive aspects without connecting them to spiritual values (Faqihuddin, 2017). In the Islamic scientific tradition, science and religion are two complementary entities. The Quran itself contains many kauniyah verses that encourage humans to contemplate natural phenomena as signs of the greatness of Allah SWT. Thus, physics learning can be used as a means to read the verses of Allah in the universe. Integration of science with the Quran can provide a more comprehensive learning meaning, not merely logical-mathematical but also transcendental (Rahmawati & Bakhtiar, 2019). One example of the integration of fluid and Islamic concepts, water is the main example of a liquid studied because of its unique physical properties, such as density, viscosity and surface tension. Scientifically, water plays a vital role in biological systems, hydrological cycles and ecosystem balance. Islam firmly places water as a source of life, as it states that every living creature was created from water. This is in line with modern scientific findings which state that biological life cannot occur without water as an essential fluid (Sabra, 2003).

In the context of Islamic universities, the integration of science and Islam is highly relevant because it is part of the scientific paradigm they promote. The paradigm of scientific integration in Islamic universities is not only to avoid the secularization of science but also to produce graduates capable of developing science ethically and in accordance with Islamic values (Ihsan et al., 2021)

Thus, the integration of science and Islam in physics learning at universities is not just an educational innovation, but a strategic need. This integration will help students understand physics as a science that not only explains natural phenomena mathematically, but also teaches spiritual awareness, gratitude, and moral responsibility. The role of education is very important as part of efforts to build national character (Taja et al., 2021) and produce a millennial generation that is innovative, creative, and ready to face global challenges (Mahbubah, Santoso, Prafianti, et al., 2025). 21st-century education directs students to improve various skills (Baloran, 2020) and forms students' morals and character through utilizing the role of digital literacy in education (Subakir, 2020).

Based on the problem description, it is necessary to conduct a module needs analysis in order to develop module for fluids courses with an integration of science and Islam. The purpose of this study is to describe the needs of pre-service science education and the availability of Islamic integrated fluid modules in fluid courses.

## METHOD

This study uses a qualitative method. This approach was chosen to gain an in-depth understanding of the needs of students and lecturers in developing an Islamic-based integrated fluid module in the Fluids course. The research subjects were 23 Science Education students who had taken the Fluids course in the previous semester. The study aimed to obtain in-depth information on module needs as the basis for developing a valid Islamic-integrated fluid module. The research instrument was a questionnaire to collect data on the analysis of students' module needs and lecturers' needs through interviews. The data analysis technique in this study was descriptive data analysis, through a questionnaire about the results of the analysis of students' module material needs and a description of the results of interviews with lecturers' needs analysis of the Fluids course. Indicators and aspects used as benchmarks to obtain this needs analysis data are: (1) the learning system used by students; (2) student difficulties in learning physics; (3) learning resources used by students in the Fluids course and (4) students' needs for the development of an Islamic-based integrated science module as a learning resource. The questionnaire results from all respondents for each statement in the questionnaire describe how students perceive the need for the development of an Islamic-based integrated and flexible module. The results of the module needs analysis are then presented with the criteria in Table 1.

Table 1. descriptive analysis criteria

Presentation	Criteria
75%-100%	Really need
50%-74%	Need
25%-49%	Do not need
0%-24%	Really do not need

## RESULTS AND DISCUSSION

### Analysis of the Needs and Availability of Module for Students

Questions were developed to describe students' needs in developing an Islamic-integrated physics module. A questionnaire was distributed to students who had taken fluids courses as an initial step in the product development process, with the aim of identifying student needs to support classroom learning activities. The results of this needs questionnaire can be used as a basis for developing the module as a learning resource. The module will be developed as teaching material for students to assist in understanding the concepts being studied. These questions relate to textbooks, fluids, and Islamic integration.

The teacher needs analysis questionnaire aims to identify the real-world situations faced by teachers in their learning, including the obstacles and support needed in implementing teaching. This instrument is used as a basis for designing or developing educational products, such as teaching materials, models, and learning media. Specifically, its objectives are:

1. To describe the current state of learning, particularly regarding the use of methods, approaches, and media.
2. To identify obstacles that arise in delivering material and student characteristics.
3. To understand teachers' perspectives and readiness for learning innovations, such as the implementation of integrated Islamic science modules.
4. To uncover teachers' needs regarding the format and characteristics of the products to be developed.
5. To serve as a basis for consideration in designing learning products that meet real-world needs.
6. This instrument consists of 10 questions with "Yes" or "No" answer options. The complete results of the teacher questionnaire are presented in Table 1.

**Table 1.** Results of Teacher Needs Analysis

No	Statement	Percentage (%)
1	The teacher has connected the fluids topic to Islamic values.	100
2	The teacher uses a specific model/approach in teaching fluids.	80
3	The fluids topic is appropriate for the students' needs.	100
4	The teacher experiences difficulties in using learning media.	80
5	The teacher feels the need for a module based on Islamic values.	20
6	The teacher understands the concept of fluids integrated with Islamic values.	100
7	The teacher can implement fluids integrated with Islamic values.	80
8	The teacher observes increased student participation through integrated Islamic learning.	100
9	The teacher delivers fluid learning by integrating Islamic values.	80
10	Teachers implement science learning based on Islamic values.	100
Mean		84

Table 1 provides information on the availability of teaching materials and the need for teaching materials for fluids courses, with an average score of 84%, based on the percentage of needs analysis with the criteria of being highly needed.

This questionnaire consists of 10 statements with "agree" or "disagree" answers and was completed by 36 10th-grade students selected through cluster random sampling. The complete questionnaire results are shown in Table 2.

**Table 2.** Needs analysis Fluid module

Statements	Agree (%)	Disagree (%)
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The use of varied learning resources makes it easier for students to understand the material	85	15
Integrated Islamic Fluid Learning is needed, in accordance with lecture studies in accordance with the needs of the times.	82	18
Integrated Fluid Learning of Science and Islam trains collaboration and creative skills	90	10
Integrated fluid learning science and Islam make me more motivated to learn, enthusiastic and interested in learning.	79	21
Mean	84	16

The table above provides information on the analysis of students' needs for textbooks for fluids courses, with an average score of 84%, based on the percentage of needs analysis with the criteria of being very much needed.

**Table 3.** Analysis of the availability of integrated science and Islamic fluid module

Statement	Agree (%)	Disagree (%)
The availability of lecture references used in the Integrated Fluids Science and Islam course is adequate.	18	82
The reference books available in the library for the Fluids course are complete.	13	87
The module used and the lecturer's explanations in the Fluids lecture were quite understandable.	15	85
The Fluids lecture has been implemented by forming several discussion groups.	22	78
Mean		83

## Discussion

The analysis of module needs and availability revealed inadequate resources. Students stated that the learning materials they accessed could be improved and that additional references on Fluids were needed in the library. Lecturers' reviews of the module used should be more detailed to enable students to understand the Fluids course and to innovate more to meet current needs and developments. Furthermore, the current lecture process has focused on forming discussion groups, providing simple experiments related to the material covered, and difficulties in integrating fluids with Islam. This is due to the limited availability of relevant references, which makes students less active and less structured. Lecturers who use module that align with the learning outcomes target have the potential to motivate students and participate more actively in learning. Furthermore, the role of module that are structured according to learning outcomes will impact student achievement and be more active in the learning process because students have prepared themselves by reading the material in the module before it is discussed in the lecture.

Based on the results of the questionnaire on the need for teaching materials for fluids learning courses, an average score of 83% was obtained, with the criteria of being highly needed. Limited module are available and the development of integrated fluid science and Islamic teaching materials is needed. The current learning process has resulted in students being less active in learning, centered on the lecturer. During the learning process, information was obtained that learning activities are still dominated by the lecturer, and during these activities, students tend to participate less (Vinalia Amanda et al., 2025). One method that can be applied to improve the quality of the learning process is to develop module that are appropriate to the characteristics and conditions of students to reduce obstacles and difficulties in learning. Learning using module as teaching materials provides opportunities for students to be actively involved in the learning process to achieve learning objectives. Therefore, module development is needed for a more optimal learning process (Guslinda et al., 2025).

An engaging module is essential for the learning process as it can enhance students' motivation and interest in learning. The development of a Fluid module integrating science and Islam is an innovation and serves as a reference for the Fluid course. Innovative learning requires research on the latest teaching methods, in line with current developments, such as integrated science and Islamic Fluids, which can develop students' character, collaboration, communication, critical thinking, and creativity. Module are a valuable resource for students to learn independently, incorporating complex concepts and instruction (Afriani & Sabani, 2025). The use of integrated Islamic module can enhance students' faith and piety in God Almighty, as all knowledge

originates from the Qur'an (Syarifah & Ifadah, 2023).

Module can be used as learning resources, but they are still not implemented in the learning process. Learning using module makes students active and independent. Learning using module will improve students' skills in learning independently without relying on teachers (Jayanti & Syhaza, 2025). Using module as learning resources is indeed very helpful in understanding the material. Besides the language being easy to understand, the use of illustrations in the module can attract students' attention. Furthermore, example questions and their solutions also help students understand the material (Zakiyatur Rizqi & Faiq Makhdum Noor, 2025).

The use of module as learning resources provides several advantages, including: (1) providing immediate feedback; (2) can be adapted to individual student abilities by providing freedom in determining the speed of learning and understanding, the form and material of the lesson; (3) after the evaluation, teachers and students will know which parts of the module the students have successfully achieved and which parts have not yet achieved their learning objectives; and (4) students achieve learning objectives according to their abilities (Bakri et al., 2015). In addition, the development of module that integrate the Qur'an and hadith can improve students' religious character (Septiyani & Ramadan, n.d.).

Learning success is based on learning outcomes, and learning outcomes for a course can be optimally achieved through the use of appropriate module. Appropriate module are crucial in supporting lecturers and students in learning according to plan (Arinda Sari & Pendidikan Fisika, 2023) Module provide guidance for students, guiding activities in the learning and work process, which essentially must be mastered. According to module, the learning process will run smoothly, practically, and effectively. Module with more varied and engaging content for students make learning effective (Muhajang et al., n.d.). Thus, the presence of module can transform the role of lecturers from previously being learning resources to facilitators, making the learning and lecture process more effective and interactive.

## CONCLUSIONS

Based on the results of the teacher needs analysis, developing a fluid module integrated with science and Islam received a score of 84% (very much needed). From the results of the student needs analysis, the learning indicators for integrated fluids with science and Islam trained collaboration and creativity skills, which received a score of 90%. The availability of fluid modules integrated with science and Islam is still limited, so the development of relatively new modules that are in accordance with the latest developments is very necessary. However, this study is limited to the needs analysis and further development can be carried out to develop modules according to the needs and characteristics of students.

## Acknowledgment

My deepest gratitude to all parties involved and supporting this research, especially Kementerian Pendidikan Tinggi, Sains, dan Teknologi through Penelitian Dosen Pemula program so that this research can be carried out well, Science Education Department in Universitas Islam Lamongan, validators and all of students Science education.

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