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Design of The Heyzine Flipbook Interactive E-Module Based on SDGs for The Course Fundamentals of Islamic Science

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Abstract

This research aims to develop and test the validity and effectiveness of an interactive Heyzine Flipbook e-module based on SDGs for the course fundamentals of islamic science. This research uses the Research and Development method with the ADDIE approach. The subjects are 20 students from the Chemistry Education Study Program. The data was collected using a needs questionnaire, a validity questionnaire, a student response questionnaire, and a student ability test. The research results show that e-module has a very high validity level with an Aiken's V index of 0.98, it is declared very suitable for use in learning. Based on the hypothesis test using the Wilcoxon Signed-Rank Test, a p-value of 0.000084 < 0.05 proving a significant difference between the students' pretest and posttest scores. The effectiveness of e-modul is also reinforced by the acquisition of an N-Gain score of 0.76 (high category) and effect size of 0.458 (moderately effective). Based on these findings, the Heyzine Flipbook interactive e-module based on the SDGs was very well received by students and proved effective in significantly improving learning outcomes in the course.

Keywords: fundamentals of islamic science; heyzine flipbook, interactive e-module, SDGs

Abstrak

Penelitian ini bertujuan untuk mengembangkan dan menguji validitas dan efektivitas modul elektronik interaktif Heyzine Flipbook berbasis SDGs untuk mata kuliah dasar-dasar ilmu agama Islam. Penelitian ini menggunakan metode Penelitian dan Pengembangan dengan pendekatan ADDIE. Subjek penelitian adalah 20 mahasiswa dari Program Studi Pendidikan Kimia. Data dikumpulkan menggunakan kuesioner kebutuhan, kuesioner validitas, kuesioner respons mahasiswa, dan tes kemampuan mahasiswa. Hasil penelitian menunjukkan bahwa modul elektronik memiliki tingkat validitas yang sangat tinggi dengan indeks Aiken's V sebesar 0,98, sehingga dinyatakan sangat cocok untuk digunakan dalam pembelajaran. Berdasarkan uji hipotesis menggunakan Uji Peringkat Bertanda Wilcoxon, nilai p sebesar 0,000084 < 0,05 membuktikan adanya perbedaan signifikan antara nilai pretest dan posttest mahasiswa. Efektivitas e-modul juga diperkuat dengan perolehan skor N-Gain sebesar 0,76 (kategori tinggi) dan ukuran efek sebesar 0,458 (cukup efektif). Berdasarkan temuan ini, e-modul interaktif Heyzine Flipbook yang berbasis SDGs diterima dengan sangat baik oleh mahasiswa dan terbukti efektif dalam meningkatkan hasil belajar secara signifikan dalam mata kuliah tersebut.

Keywords: buku flipbook heyzine; dasar-dasar ilmu Islam; modul elektronik interaktif; SDGs

Introduction

Based on the Indonesian National Qualification Framework curriculum, the course "Fundamentals of Islamic Science" expects students, as future teachers, to be able to understand the basic concepts of science from an Islamic and modern scientific perspective, technological developments, and their implications for society. As Muslim intellectuals, students are also expected to be able to understand Quran-based science concepts. In addition, students are expected to be able to explain Quranic verses related to scientific facts and phenomena, thus internalizing Islamic values in their lives. To achieve these curriculum demands, students need learning resources that support a quality learning process (Rahmi, 2023).

However, in the learning process, students have primarily used learning resources from the internet, websites, and sites to obtain learning materials. Based on the results of a needs analysis conducted with lecturers and students, it was found that the learning resources currently used do not meet the demands of the chemistry education program's curriculum, and therefore, they require comprehensive learning resources to support a more optimal learning process. Innovation in the use of technology in digital-based learning is also found to be still very minimal. Ideally, the learning process requires learning resources that align with curriculum expectations (Denisa & Astimar, 2024) and utilizes the sophistication of technological devices (Hasanudin et al., 2021; Kumalasari et al., 2023).

Based on the issues mentioned above, it can be concluded that the course fundamentals of islamic science requires innovation in technology-based learning resources (Nasir et al., 2022) that can benefit students in the form of interactive e-modules (Rahmatsyah & Dwiningsih, 2021). Interactive e-modules are digital-based learning resources (Fibonacci et al., 2021; Hayati et al., 2024) specifically designed so that students can learn independently and flexibly (Rahmi, 2023). Beside making it easier for students to obtain learning materials (Wahyudi et al., 2025), the combination of text and images with various multimedia elements such as audio, video, animation, and simulations presented in interactive e-modules also has the potential to provide students with an interactive (Denisa & Astimar, 2024), impressive (Royhanin & Sungkono, 2022), and easily accessible (Martatiyana et al., 2022) learning experience. In terms of its use, interactive e-modules have proven to be very practical (Rusmansyah et al., 2021) for use as a learning resource.

Interactive e-modules can be designed attractively using Heyzine Flipbook (Hasan & Andayani, 2025); (Ezha et al., 2024). This application can be easily accessed using digital devices such as laptops or smartphones. Heyzine Flipbook has various advantages and interesting features that support image design, audio, and video (Erawati et al., 2022), creating an animated effect like a digital book (Manzil & Thohir, 2022). The advantages of innovative interactive e-module design using Heyzine Flipbook as a learning resource can increase learning interest and the quality of the learning process (Yuni et al., 2025). This is an effort to support sustainable education (Berlianti et al., 2023) as the 4th pillar in the Sustainable Development Goals (SDGs) program (Nugraheni, 2024; (Safitri et al., 2022). The design of interactive e-modules also has a positive impact on the environment by reducing paper usage (Hayati et al., 2024), thus supporting the 13th pillar of environmental sustainability.

Integrating the SDGs into learning in higher education is very important to do. This effort can be realized by integrating the SDGs as an approach in learning resources (Taufik et al., 2024). However, currently, relevant learning resources for students related to the topic and values of the SDGs are still very limited (Mohammadnia & Moghadam, 2019). Therefore, it is important to conduct research on the Design of Interactive E-Module Heyzine Flipbook Based on SDGs as a comprehensive digital-based learning resource and to instill values that support the pillars of sustainable

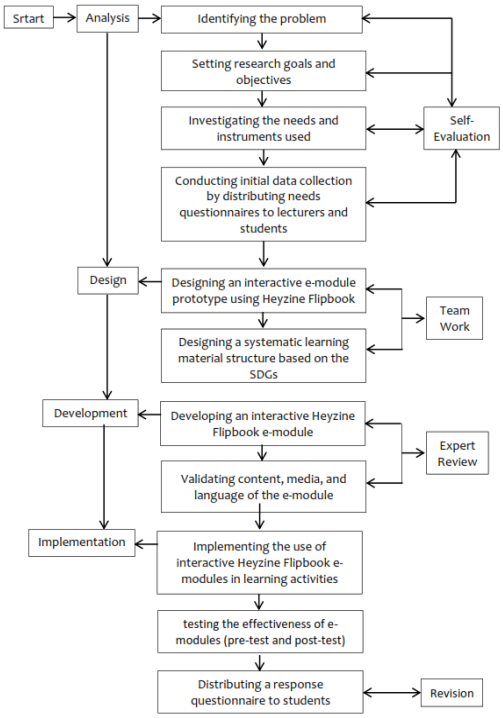
development for students in the Islamic Science Fundamentals Course in the Chemistry Education Study Program.

Some previous studies on e-module development using Heyzine Flipbook have been reported by Muafiyah et al., (2024), who developed an e-module for Theme 8 Subtheme 1 in Class V. Similar research has also been conducted by Amiyah, (2024), who developed an e-module for teaching biographical texts in Class X. Furthermore, (Ezha et al., 2024) also tested the effectiveness of a Flipbook based on ethnoscience to support the implementation of SDGs on the topic of nanotechnology integrated with augmented reality. (Taufik et al., 2024) also developed an e-module for science learning to support SDGs based on ecoliteracy. The results of the study showed that developing e-modules using Heyzine Flipbook produced a very attractive learning resource design. However, the study was limited to only testing the validity and responses of the students. However, the effectiveness of the developed product has not yet been tested. Meanwhile, the SDGs approach in developing e-modules has tested the product's effectiveness, but the SDGs values integrated are still limited to 1 pillar of sustainability. Based on a review of relevant research, the researcher wants to innovate by designing an interactive e-module using the Heyzine Flipbook application, embedding SDGs values relevant to the content of the course fundamentals of islamic science material, and testing the validity and effectiveness of the developed product.

Method

This research falls into the category of research and development with the Analysis, Design, Development, Implementation, Evaluation (ADDIE) approach (Branch & Varank, 2009). In this study, ADDIE was chosen as a systematic research framework for developing student learning resources in the course fundamentals of islamic science, namely the SDGs-based interactive Heyzine Flipbook e-module. The product development steps using the ADDIE approach employed in this study are presented in detail in Figure 1 (Ezha et al., 2024).

Figure 1.
Diagram of Developing the SDGs-Based Interactive e-Module



The population of this study is students from the Chemistry Education Study Program at UIN Ar-Raniry Banda Aceh. The research sample included 25 students from the Chemistry Education program who were taking the course fundamentals of islamic science. The research data was collected using questionnaires and test questions. This study uses 3 types of questionnaires: 1) A needs questionnaire to collect data on the needs of lecturers and students in the initial needs analysis stage using a Guttman scale; 2) A validation questionnaire to obtain validity from an expert team regarding the material, design, and language aspects of the developed product using a Likert scale; and 3) A response questionnaire to obtain student feedback after using the developed product in the learning process, also using a Likert scale. The test questions used are multiple-choice questions based on CPMK of the course fundamentals of islamic science and integrated with the SDGs pillars.

The techniques used to collect data in this study include: 1) Surveys using questionnaires designed to elicit information about attitudes, behaviors, opinions, and so on. The surveys used in this study are needs analysis surveys, validation surveys, and surveys of student responses to the developed e-module product; 2) tests used in this study are tests to measure students' cognitive abilities before (pretest) and after (posttest) being taught using the developed product. Data from the needs analysis and student responses to the e-module were analyzed using percentage techniques (Widagdo et al., 2020) as follows.

$$P = \frac{f}{n} \times 100\%$$

P is the percentage of student needs and response scores, f is the total score obtained from collecting needs and response data, and n is the maximum total score. The results of this analysis were then interprated according to the categories in Table 1.

Table 1.
Student Response Criteria

Achievement (%)	Category
76-100	Very good
56-75	Good
40-55	Quite good
0-39	Not good

(Riduwan, 2022)

The validity of the e-module developed was analyzed using the Aiken V technique (Bashooir & Supahar, 2018) with the following formula.

$$V = \frac{\in s}{n\,(c-1)}$$

V represents the validator agreement index, s is the total value given by each validator minus the lowest value on the e-module assessment scale, n is the number of validators assessing the e-module, and c is the number of questionnaire assessment scales that can be selected by the validator. The validity of the e-module is categorized based on the Aiken V index value in Table 2.

Table 2.
Interpretation of Aiken's V Index for e-Module Validity

Aiken's V Score	Validity Criteria	Conclusion
0.81<V≤1.00	Very high	Very valid
0.61<V≤0.80	High	Valid
0.41<V≤0.60	Moderate	Moderately valid
0.21<V≤0.40	Low	Slightly valid
0.00<V≤0.20	Very low	Not valid

(Trianto, 2009)

Before conducting a difference test on pretest and posttest scores, the distribution of student learning outcomes data was analyzed using the Shapiro-Wilk normality test. Data is normally distributed if the obtained significance value is greater than the significance level (> 0.05) (Cohen, 2013).

If the data is normally distributed, the research hypothesis will be analyzed using the paired sample t-test. Conversely, if the data is non-normal, it will be analyzed using the non-parametric Wilcoxon Signed-Rank Test (Iskandar et al, 2021). Ho is rejected if the obtained significance value is less than the significance level (< 0.05), indicating a significant difference between pre-test and post-test scores (Lazar, 2017).

Ho: There is no significant difference between pre-test and post-test scores.

Ha: There is a significant difference between pre-test and post-test scores.

Student learning outcomes were analyzed using the N-Gain test to measure the improvement in student learning outcomes after instruction using an SDG-based e-module. The N-Gain improvement analysis was calculated using the following formula.

$$N - Gain = \frac{posttest\ score - pretest\ score}{ideal\ score - pretest\ score}$$

The criteria for improving student learning outcomes are then interpreted based on the N-Gain score intervals in Table 3.

Table 3.
Guidelines for N-Gain improvement

N-Gain Score	Improvement Criteria
g < 0.3	Low
0.3 ≤ g < 0.7	Moderate
g ≥0.7	High

(Hake, 2022)

The effectiveness of the e-module is then analyzed using an effect size test. This test aims to determine the strength of using the e-module on improving student learning outcomes (Rahmi, 2023). Effect size is calculated using the following formula with d represents the effect size, MA is the pretest mean, MB is the posttest mean, and SDpooled is the pooled standard deviation of the pretest and posttest.

$$d = \frac{M_A - M_B}{SD_{pooled}}$$

The effectiveness of the SDGs-based e-module in improving student learning outcomes is interpreted based on the criteria in Table 4.

Table 4.
The Interpretation of e-Module Effectiveness

Effect Size Score	Conclusion
d < 0.3	Less effective
0.3 < d< 0.5	Quite effective
d > 0.5	Very effective

(Cohen et al., 2013)

Result and Discussion

This research is a development study (R&D) using the ADDIE model (Analysis, Design, Development, Implementation, and Evaluation). The analysis stage (analysis) involved curriculum analysis, analysis of the Course Learning Plan (RPS) for the course fundamentals of islamic science, and an assessment of the needs of lecturers and students regarding learning resources for the course fundamentals of islamic science.

The results of the curriculum and RPS analysis are presented in Table 4.

Table 4.
Results of needs analysis

Aspects Analyzed	Analysis Results
Curriculum	The Chemistry Education Study Program implements an OBE-based KKNI curriculum
RPS	The course fundamentals of islamic science has three CLOs: to master the concept of the integration of Islam and science, to be able to analyze and formulate the historical development of Islamic and scientific civilization, and to be able to identify and describe phenomenal figures of science in Islam. These are broken down into five Sub-CLOs, including: 1) to be able to conclude the concept of the integration of Islam and science; 2) to be able to analyze the historical development of Islamic and scientific civilization; 3) to be able to completely describe the biographies of Muslim scientists in the fields of Physics, Chemistry, Biology, and Mathematics; 4) to be able to describe the scientific phenomena contained in the Quran; and 5) to be able to analyze the concept of science in the Quran
Faculty needs	The teaching materials have been used from books, the internet, and journal articles. The digital teaching materials used are from the internet, e-books, and e-journals, but integrated SDGs teaching materials have never been used. Lecturers find it difficult to integrate SDGs into the course fundamentals of islamic science. Lecturers need digital teaching materials integrated with SDGs for the course fundamentals of islamic science because such materials are not yet available in the Chemistry Education program at UIN Ar-Raniry
Student needs	The learning resources used so far have been from the internet, books, and journal articles. Students use digital learning resources such as the internet and websites, but these are not yet based on the SDGs. According to students, integrating the SDGs is important in lectures, and students need digital learning resources integrated with the SDGs

At the design stage, the process of creating storyboards and prototype designs is carried out. The design process begins with outlining the material according to the results of the RPS analysis. The material outline included in the e-module consists of 5 chapters: science from an Islamic perspective, the history of Islamic civilization and the development of science, Muslim scientists, scientific phenomena in the Quran, and the concept of science in the Quran. Next, the material is compiled according to the outline, integrating SDGs using various references and typing it using the Microsoft Word application. After all the material is complete, an e-module storyboard is created, including the cover, table of contents, CPMK and Sub CPMK, concept map, SDGs overview, material descriptions, evaluation questions, and bibliography. The next step is to design the prototype using the CanvaPro application. This includes designing the cover, background, material placement, photos, and videos for the e-module.

Based on the evaluation results of the designed e-module prototype, several shortcomings were found that need to be revised. The initial prototype cover design was deemed less appealing in terms of the background color composition, and the images displayed were not relevant to the e-module title. CPMK and Sub-CPMK were initially designed separately, but after evaluation, they were designed on a single page to fully and comprehensively display the course fundamentals of islamic science course curriculum. Based on the evaluation results, an overview of the SDGs is important to include in the e-module so that students have prior knowledge of the SDG concept before they learn more about integrated Islamic science material. On the overview page, videos about the SDGs and links about the SDGs from the BAPPENAS website were added. Each material page is designed with

an attractive background color and includes images related to the concepts discussed and the integrated SDG pillars.

Figure 2.
Display of Interactive e-Module Heyzine Flipbook Based on SDGs for the Course Fundamentals of Islamic Science

In the development stage, the e-module was developed based on the storyboard and prototype that had been designed in the design stage. The e-module development process was initially carried out using the CanvaPro application and then imported into the Heyzine Flipbook application. The results of the e-module development are presented in Figure 2.

The developed product was then evaluated by a team of validators. The validity test was conducted on the media, content, language, and integration of SDGs aspects in the e-module. This validation involves three validators from UIN Ar-Raniry and UIN Sunan Kalijaga. The results of the data validation analysis on four aspects of the e-module in Table 5.

Table 5.
Validity of the Interactive e-Module Heyzine Flipbook Based on SDGs

Assesment aspects	Aiken V index	Validity criteria
Media	0.94	Very high
Content	0.98	Very high
Language	0.98	Very high
Integration of SDGs	1.00	Very high
Average Validity	0.98	Very high

In Table 5, it is known that the results of the validity test for the interactive e-module heyzine flipbook based on SDGs for the course fundamentals of islamic science obtained an average Aiken V index of 0.98 with very high validity criteria. The validation results show that the media aspect obtained an Aiken V index of 0.94. The content and language aspects obtained a higher Aiken V index of 0.98. Compared to other aspects, the results of expert validation for the SDGs integration aspect obtained the highest Aiken's V index of 1.00 with very high validity criteria. Thus, it can be concluded that the media, material, language, and SDGs integration aspects in the Heyzine

Flipbook e-module based on the course fundamentals of islamic science are highly valid.

The assessment results of the quality of the Heyzine Flipbook e-module based on SDGs for the course fundamentals of islamic science by experts showed that the e-module obtained an average Aiken V index of 0.98 with a very high validity category ($0.81 < V \leq 1.00$) (Trianto, 2009). The findings of this research indicate that the developed e-module has an excellent level of suitability in terms of media, content, language, and SDGs integration. The highest Aiken V index value for the SDGs integration aspect confirms that the Heyzine Flipbook interactive e-module for the course fundamentals of islamic science has successfully integrated the principles of sustainable development into the learning content contextually and applicatively. The findings confirm that digital flipbooks are effective in presenting content that is engaging, interactive, and easily accessible to students. These validity scores indicate that the values of the SDGs are effectively integrated into the course material and are able to increase the relevance of learning to students' real-life context.

The validation results of the Heyzine Flipbook interactive e-module for the course fundamentals of islamic science are also in line with the views of Rieckmann, (2022) that integrating the principles of Education for Sustainable Development (ESD) into course materials can foster students' critical awareness of global, environmental, social, and economic sustainability issues. In this context, the Heyzine Flipbook e-module based on SDGs is not only technically valid but also pedagogically and contextually relevant. Therefore, it can be concluded that the Heyzine Flipbook e-module based on SDGs developed thru the ADDIE model has met the criteria for being highly valid. This indicates that the e-module design is already suitable to proceed to the implementation and evaluation stage to measure its effectiveness in improving students' understanding of SDGs concepts in the course fundamentals of islamic science.

Based on the evaluation results of the validator team regarding the quality of the developed e-module, several improvements need to be made to refine the content of the e-module. Based on the suggestions provided by the validators, an evaluation has been conducted on the integration of SDGs in each topic and the relevance of the background design to the text in the e-module. Next, in the sub-chapter on the relevance of Islam and science, supporting figures such as Syed Muhammad Naquib al-Attas and Fazlur Rahman need to be added. The verses of the Quran linked to the material description need to be supplemented with the views of relevant scholars and the views of Sheik Yusuf Qardawi in his book Al-Malamih Al-Mujtama' Almuslim Alladzi Yansyuduhu.

The flipbook which was developed and revised based on validator suggestions, was then implemented in the course fundamentals of islamic science lecture. The implementation was carried out to determine the effectiveness and student response to the developed e-module. To measure the effectiveness of the interactive Heyzine flipbook-based e-module for the course fundamentals of islamic science, pre-test and post-tests were conducted during the implementation phase before and after students used the e-module in the classroom learning process.

Table 6.
Result of the Saphiro Wilk test

Data	Sig.	Decision
Pre-test score	0.009985	Not normally
Pos-test score	0.019682	Not normally

The results of the normality test analysis using the Shapiro-Wilk in Table 6 show that the significance values for pretest and posttest scores are smaller than the significance level of 0.05. These findings indicate that both datasets are not normally

distributed (Cohen et al,. 2013) Furthermore, the results of the data analysis using the Wilcoxon Signed-Rank Test in Table 7 show a p-value of 0.000084, which is smaller than the significance level of 0.05. Thus, Ha was accepted, indicating a significant difference between pretest and posttest scores (Lazar, 2017).

Table 7.
Results of the Non-Parametric Wilcoxon Signed-Rank Test

Parameter	Sig.
Z	0,0
p-value	
Asymp. Sig. (2-tailed)	0.000084

The significant improvement in student learning outcomes, as indicated by the Wilcoxon Signed-Rank Test confirms that the use of the SDGs-based interactive Heyzine Flipbook e-module has a real positive impact in the course learning process. This significance value, which is far below 0.05, indicates a striking difference between students' understanding before and after using the media. This finding aligns with the Multimedia Learning theory proposed by Mayer, (2020), where the integration of visual elements, text, and interactivity in the e-module is able to facilitate deeper cognitive processing compared to conventional static media.

Table 8.
Results of the N-Gain Test for Using e-Modules

Number of Students	Average of Pre-Test Score	Average of Post-Test Score	N-Gain Score
20	45.25	86.25	0.76

The results of data analysis using the N-Gain technique in Table 8 show that before learning, the average pre-test score was 45.25. After the learning process using the interactive e-module heyzine flipbook based on SDGs, the average post-test score increased to 86.25. The results of the N-Gain analysis on these two data sets yielded an N-Gain score of 0.76. Based on the criteria, the average N-Gain score obtained from the implementation of the e-module in the learning process falls within the range of $g \geq 0.7$ with a high category (Hake, 2002). This finding is supported by Putri & Hakim's (2024) research, which states that the Heyzine Flipbook platform is able to significantly improve learning outcomes due to its ability to present complex material in a more structured and interactive way.

The results of the e-module effectiveness test in learning yielded an effect size score of 0.485. Based on its interpretation, the effect size score obtained in this study falls within the range of $0.3 < d < 0.5$, which is considered moderate (Cohen, 2013). This finding proves that the interactive Heyzine Flipbook e-module based on SDGs developed in this study is quite effective in improving student learning outcomes in the course.

The N-Gain score proves a significant and high improvement in student understanding after using the e-module. Students also showed improved ability to link science concepts with sustainability principles (SDGs), and demonstrated a positive response to the interactivity, visual display, and integration of Islamic values presented in the e-module. Thus, the use of the SDG-based interactive e-module is significantly effective in improving student learning outcomes.

The findings of this study are consistent with the research by Sabina et al., (2025), which reported an N-Gain value of 0.73 for the implementation of SDGs-based e-modules in biology learning. Another study reported by Badelwaer et al., (2022) obtained an average N-Gain of 0.67, indicating that SDGs-based digital e-modules

can improve students' literacy in physics learning. Research conducted by Makhrus et al., (2025) also reported an N-Gain of 0.55 for the implementation of SDGs-based e-modules. The relevant research results indicate that e-modules based on SDGs are effective in improving students' learning outcomes in science education. However, this research demonstrates an additional advantage compared to previous studies by integrating Islamic values within the context of the SDGs. This innovation not only enhances students' cognitive understanding of scientific concepts but also shapes their spiritual and ethical attitudes toward science and sustainability issues. Integrating the SDGs context and interactive digital visualization can strengthen learning engagement and concept transfer in learning.

The results of this study also support the theory of Education for Sustainable Development (ESD) (Rieckmann, 2022), which emphasizes that SDG-based learning encourages students to think critically, reflectively, and responsibly toward sustainability issues. The increase in student learning outcomes thru the interactive Heyzine Flipbook e-module proves that digital media based on the SDGs can be an effective means of instilling Islamic values relevant to the global context. Thus, the interactive Heyzine Flipbook e-module based on the SDGs is proven to be very effective, innovative, and contextual for use in the course fundamentals of islamic science learning. The results of this study also contribute to 21st-century learning models that are holistic, integrative, and oriented toward sustainability education.

Table 9.
Student Responses Regarding the e-Modules

Number of Students	Response (%)	Criteria
20	92.75	Very good

The implementation results of the Heyzine Flipbook interactive e-module based on SDGs in the lecture process for the course fundamentals of islamic science obtained a student response percentage of 92.75% as presented in Table 9. Based on student response criteria (Riduwan, 2022), it can be stated that this percentage score falls within the range of 76-100% with a very good category. This finding indicates that the Heyzine Flipbook interactive e-module based on the SDGs for the course fundamentals of islamic science developed in this study is very well received by students as users and can meet their learning needs. The results of the study indicate that students believe the appearance of the e-module, the presentation of the material, the ease of navigation, and the integration of the SDGs context are able to increase learning engagement. This finding is consistent with the results of (Fauzi & Nugraha, 2022) research, which found that digital-based interactive e-modules received a very good response. Interactive e-modules can enhance student engagement and independent learning because they provide a more interesting and flexible learning experience compared to conventional teaching materials. Furthermore, research by Kusumawati et al., (2023) also reported that flipbook-based e-modules received very positive responses from students. Interactive e-modules are able to visualize concepts in a more easily understood way and stimulate readers' curiosity (Putri & Hakim, 2025).

Similar results were also presented by (Najwa, 2023), stating that e-modules containing sustainability contexts are able to increase students' learning motivation and concern for global issues. The findings of this study support (Branch & Varank, 2009) view that the implementation phase in the ADDIE model not only tests the product's feasibility but also validates its acceptability by end-users. Positive responses from students indicate that the design and content of the e-module have met the learning needs of students in the course fundamentals of islamic science, which is oriented toward developing digital literacy and SDG awareness. Thus, it can be concluded that the

interactive Heyzine Flipbook e-module based on SDGs developed can be very well received by students. This indicates that digital learning resources based on the SDGs have strong potential to be applied more widely in other courses that are oriented toward 21st-century learning and sustainable development goals.

Conclusion

This research concludes that the interactive Heyzine Flipbook-based SDGS e-module in the course fundamentals of islamic science is deemed very feasible, effective, and very well received by students. This e-module has a very high validity with an Aiken V index of 0.98. This digital learning material has proven to be effective in significantly improving students' learning outcomes, with an N-Gain score of 0.76 (high category) and an effect size of 0.458 (moderately effective category). This research has developed an interactive e-module Heyzine Flipbook Based on SDGs for the course fundamentals of islamic science and measured its validity and effectiveness in the lecture process. For future researchers, it is hoped that this study can be continued on a wider scale, both with a larger number of respondents and in the context of other courses. Further research can also measure the influence of e-modules on other variables such as students' learning motivation, critical thinking skills, and collaborative abilities.

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