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Comics integrated with Islamic values as a learning media to enhance student's understanding

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ABSTRACT

Media in learning greatly enhances the effectiveness of the learning process, presents information more engagingly, facilitates material interpretation and condenses information, for example, comic media. The research aims to develop comics integrated with Islamic values on digestive system material to improve understanding of Biology learning concepts. The research method used is Research and Development (R&D) with the ADDIE model. The results showed that the comics integrated with Islamic values on the material of the digestive system had passed the validation process by material experts, media experts, and Islamic integration experts with a validity percentage of 90% content eligibility, 93.3% language, and 80% presentation and 93.3% cover design, 96% content suitability, and an overall appearance of 80% from media validators and 93.4% for Islamic value integration. This comic is considered very practical based on the assessment of teachers and students on small-scale and large-scale trials, with a percentage of practicality of 93.3 from teachers, 80.66% of students on small-scale trials, and 78.14% on large-scale. The implementation of comics in Biology learning also proved to be quite effective, with an N-Gain of 0.58 included in the medium category. The conclusion of the development of comics integrated with Islamic values on the material of the digestive system effectively improves students' understanding of concepts, arousing interest and supporting the understanding of complex lesson concepts.

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Keywords
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INTRODUCTION

There are two crucial elements in a learning process: teaching methods and learning media. A learning process can run smoothly if appropriate when selecting elements such as the selection of learning media. This is because the media in the learning process used by a teacher can accelerate the achievement of goals (Jannatul et al. 2022).

Learning Media is a means that can be used to convey messages or information in the learning process. This learning media is a vital element of its existence in addition to the facilitator (teacher) and learner (student) (Anitah, 2018). Media use is essential to help the teacher's shortcomings in delivering learning materials. Many subjects, including Biology, require media to provide material (Winda et al. 2021). Apart from being a means of conveying information from one party to another that can stimulate interest and increase the absorption of understanding of the material presented,

the presence of media in learning dramatically helps the effectiveness of the learning process, conveying information more interestingly, facilitating the interpretation of material, and condensing information (Nelis et al. 2022).

The reality in the field is that teachers have not fully used the appropriate learning media in the teaching process and have been unable to stimulate interest and increase student absorption of understanding of the material delivered. This follows observations and interviews with students and teachers at Madrasah Aliyah Islamic Center as Privat Foundation in North Sumatra. In the learning process, teachers only use media in the form of printed books or PowerPoints, especially in learning Biology. Besides, the learning media used does not integrate Islamic values, considering the school is an Islamic-based educational institution.

In the observation process, it was found that the teacher was good at delivering teaching materials, but the way of delivery was still monotonous. Besides that, in the process of understanding learning materials, students were required to memorize the material presented so that students were more likely to understand the material according to the context contained in the book. When asked, students forget the material that has been delivered before. It was found that the learning process began with the teacher explaining the Biology learning material related to the achievement indicators in learning. Furthermore, the teacher asks students to read the textbook, after which the teacher will test students' abilities related to the material that has been read. With this learning pattern, students are bored with learning, and in the end, they just memorize the material.

The above problems illustrate that students do not understand the material contained in the textbook. In addition, students revealed that they were less interested in reading the teaching materials provided. Therefore, teaching materials need a light presentation that attracts students' interest in reading. To improve students' understanding of concepts and knowledge about integrating the material they learn with the Al-Qur'an and hadith, which contains Islamic values like *Firstly*, the value of aqidah, which etymologically means a strong, firm, and deeply rooted bond or covenant in the heart. This value is instilled in humans from birth. *Secondly*, the value of Syariah is a guidance determined by Allah as a way to live a good life in this world and the hereafter. The values contained within syariah include discipline, security, social responsibility, justice, unity, and accountability. *Thirdly*, the value of akhlak, which in Arabic means moral character, behavior, and attitude. Akhlak encompasses one's behavior towards Allah, fellow humans, and other living creatures (Tisrin, 2017). Therefore, innovation is needed in making teaching materials, one of which is by making teaching materials in the form of comics integrated with Islamic values.

This comic media is used so that students do not feel bored reading the material because learning media combines elements of images and text that are easy to understand, and the material can be absorbed quickly. This is supported by Nafisyah et al. (2023) and Ropinta (2022), which show that with the help of comic media, the material presented is easy to understand, learning concepts are explained more practically than using media with textbooks alone because comics are a visual communication medium that has the power to convey information in an easily understandable way. Learning through images and text makes it easier for students to comprehend and remember the messages or information contained in the book. Because the brain more easily recalls information that has been seen with the eyes than just hearing the teacher's explanation without visual aids

(Haryati, 2019). This shows that students understand learning concepts better by using comic media. Dorrell, Curtis, and Rampal (1995) reported that comics have been used in educational settings for over 75 years in the United States. Typically, this aims to motivate students to become recreational readers, enabling them to expand their vocabulary knowledge, engage their imagination, and inspire a love of reading.

Through comic-based learning media integrated with Islamic values, students are expected to improve their understanding of the digestive system concept, one of the topics in Biology that discusses the processes that occur within the digestive system. The integration of Islamic values in comic media aligns with the goals of national education, which aim to "develop students' potential to become believers and devout individuals, possessing noble character, being healthy, knowledgeable, skilled, creative, independent, and responsible citizens" (Ucca et al., 2021). Furthermore, media with an integrated Al-Quran model as a source of inspiration places the Al-Quran in the learning process as the primary reference source, explaining various scientific phenomena. The integrative Al-Quran model serves as a source of confirmation, where critical analysis and discussion of scientific phenomena are conducted, followed by affirmation from the Al-Quran, which provides scientific explanations that corroborate the Quranic narrative. Both models can be employed simultaneously and synergistically in student learning (Noor, 2023). The digestive system material was chosen because it is relevant to the student's surroundings and because students have a limited understanding of the digestive system concept.

There have been many studies on comic development, such as the development of biological comics on digestive system material (Roswati, 2019; Malau et al., 2021; Fitriyah et al., 2024), nervous system material (Damopolii et al., 2023; Handayani et al., 2014), and excretory system material (Agustin et al., 2021; Panjaitan et al., 2021). However, in this study, comics were developed using material from the digestive system integrated with Islamic values. Thus, this study aims to establish comic learning media integrated with Islamic values that are valid and practical to improve concept understanding of digestive system material at the SMA/MA level. The results of this assessment show that teaching in schools can use media that support and facilitate students' understanding of concepts.

METHOD

This research uses the type of research and development *(research and development)* with the ADDIE model. The stages in the ADDIE model consist of five stages: *analyze, design, develop, implement*, and *evaluate* (Branch, 2009).

This stage of analysis (*analysis*) defines what students will learn, namely by conducting a needs analysis and material analysis. Storyboard design is carried out at the design stage, material preparation is done, and assessment instruments are prepared. Then, at the development stage (*develop*) begins the making of comic learning media integrated with Islamic values, which are then tested for validity through validation sheets given to media expert validators, material experts, and Islamic integration experts. The valid product was then tested for practicality by providing a response questionnaire to teachers and students of class XI IPA MAS Yayasan Islamic Center North Sumatra. Furthermore, the implementation stage (*implement*) is carried out with an effectiveness test to

determine the level of understanding of student concepts. The fifth stage of the ADDIE development model is the evaluation stage (*Evaluate*), where at this stage, revisions are made from the beginning of making comic media integrated with Islamic values until the implementation stage.

The research data was obtained from both qualitative and quantitative sources. Qualitative data was obtained from teacher interviews, as well as criticisms and suggestions from validators. Quantitative data was obtained through assessment using validation sheets and student response questionnaires. The data obtained were then analyzed and processed descriptively qualitative and descriptive qualitative.

Qualitative descriptive analysis is carried out by grouping information from qualitative data in the form of input, criticism, and suggestions for improvement in the questionnaire. Quantitative descriptive analysis is done by analyzing data in the form of numbers obtained from questionnaire data. To investigate the validity of comics integrated with Islamic values of digestive system material using a Likert scale obtained using instrument questionnaire data collection techniques.

"The data analysis technique employed to describe the test results of the comic, including validity and practicality tests, is a combination of descriptive qualitative and quantitative analysis. Descriptive qualitative analysis is used to analyze data from experts, teachers, and students, providing suggestions for improving the Islamic-integrated comic, as guided by the evaluation rubric in Table 1.

Table 1. Assessment criteria for media validity and practicality

No	Interval	Information
1	81% - 100%	Very valid/sangat practical
2	61% - 80%	Valid/practical
3	41% - 60%	Moderately Valid/Moderately practical
4	21% - 40%	Less Valid/Less Practical
5	0% - 20%	Invalid/Unpractical

(Sugiyono, 2019)

The evaluation and suggestions provided by the validators on the developed comic media will serve as a reference for the researcher to revise and perfect the developed comic press. Furthermore, it will proceed to the practicality testing stage, which can be measured through student responses to the comic learning media (Table 1)

The effectiveness of comic-based learning media in research development is analyzed using effectiveness analysis based on students' problem-solving results, using N-gain or normalized N-gain calculation, according to Meltzer (Fahrudin, 2025).

Table 2. Media effectiveness evaluation standards

No	Student scores	Category
1	G > 0,7	High
2	0,3 < g ≤ 0,7	Moderate
5	G ≤ 0,3	Low

(Fahruddin, 2025)

Based on the N-Gain value criteria (Table 3), the science comic learning media integrated with Islamic values can improve students' conceptual understanding if the N-Gain value is greater than or equal to 0.3 (≥ 0.3)

RESULTS AND DISCUSSION

The development of comic learning media integrated with Islamic values using the ADDIE model begins with the *analysis* phase. During this phase, an initial analysis is conducted to identify existing problems in the field through teacher interviews and analysis of student needs assessment questionnaires. The results show that limitations in media use during the learning process cause students to feel bored quickly and have difficulty understanding the concepts taught by teachers. Furthermore, teachers only use printed books or PowerPoint presentations, especially in biology lessons. Additionally, the learning media used do not integrate Islamic values, despite the school being an Islamic-based educational institution. The study also found that students struggle with the reproductive system material in biology, as they cannot accurately explain the human digestion process in stages. Students are only able to mention the organs present in the digestive system. A study by Aisyah et al. (2021) revealed that the difficulties faced by students in learning about the human digestive system were primarily due to the infrequent use of varied media in online learning. In the online learning, abstract materials are challenging to comprehend, especially when presented using scientific language. Based on these findings, a development research study was conducted using comic media integrated with Islamic values on the digestive system material to improve students' conceptual understanding in grade XI of Madrasah Aliyah Swasta Yayasan Islamic Centre Sumatera Utara.

The next stage is the design phase, which involves creating a storyboard, compiling materials, developing assessment instruments, creating validity questionnaires, and practicality questionnaires for the product. In designing the storyboard for the comic integrated with Islamic values, the storyline is created. For the comic integrated with Islamic values on the digestive system material, the design was created using the Canva application and paper with A2 size (420 x 594 mm). The font used for the conversation balloon content is "Times New Roman" with a size of 9, and the font used for the title is "whocat" with varying sizes from 12 to 44.5. Green and brown colors dominate the comic. The following is an overview of the comic's content.



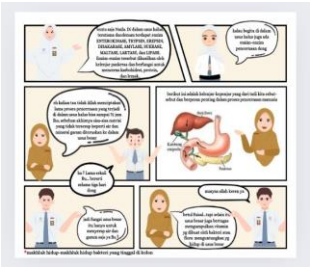
Figure 1. Example of islamic-value integrated comic on digestive system

Following the completion of the design, the next stage is the development stage of the comic, where the researcher produces the developed product as planned. The activities carried out during the development stage include a) validation by material experts, b) validation by media experts, and c) validation by Islamic integration experts.

Table 3. Result of media expert review

Evaluation parameters	Percentage (%)	Category
Cover Desain	93,3	Very Valid
Connect relevance	96	Very Valid
Display all	80	Valid

Table 4. Revision notes from expert media translation validator

Suggestion	Before	After
The cover should include elements related to the digestive system		
The character reduction in this story makes it more focused		
The image must include a caption to facilitate understanding		
When drawing characters, all figures should have eyes		
Adding interesting information points to the comic can make it more engaging and sources should be included to ensure accuracy.	It had no beginning	

A media expert lecturer conducted media validation, and the assessment results were in the form of scores that served as data, which were then converted into percentages to match the media

feasibility criteria. The expert lecturer provided the validation and revision criteria to improve the product quality. The media validation results for product feasibility are presented in the table.

Based on suggestions from media experts, as seen in Table 4, several improvements were made, including design changes, reduction of characters in the comic, replacement of elements (types of food), redesign of character facial expressions, and addition of image explanations. Following validation by material experts, the developed learning media was declared valid with an average score of 92%. Based on the percentage, it is aligned with the validity criteria table of the Likert Scale (Sugiyono, 2019), and thus, this achievement score falls into the category of highly valid.

Validation was conducted by a lecturer who is an expert in the digestive system, and the assessment results obtained were in the form of scores that served as data, which were then converted into percentages to be matched with the media feasibility criteria. The validation criteria from the expert lecturer were used to improve the product quality. The results of the media validation on product feasibility are presented in Table 5.

Table 5. Assessment outcomes from material expert

Evaluation Parameters	Percentage (%)	Category
Content validity	90	Very Valid
Language	93,3	Very Valid
Presentation	80	Valid

Table 6. Material validation expert's review and revision comments

Suggestion	Before	After
Undertaking a search for supplementary references on the advantages of chewing food 30 times to inform the development of relevant information.	The discussion emphasizes that chewing food 30 times is beneficial because it leads to more thorough food digestion.	In addition to the mechanical breakdown of food, chewing 30 times stimulates salivary glands to secrete more saliva, which contains digestive enzymes that facilitate nutrient absorption.
Transferring the 'Did you know' segment to the back page of the story for enhanced reader engagement	The informative section 'Did you know' is positioned at the bottom of page 4 within the comic narrative.	A 'Did you know' section is included at the back of the page, offering expanded explanations and contextualizing relevant information.
Embedding the importance of saliva in the learning process into the conversational flow of the comic.	Page two explains the digestive process within the oral cavity, including mechanical digestion facilitated by teeth and tongue and chemical digestion enabled exclusively by salivary gland activity.	Page two incorporates a dialogue element that prompts discussion on the salivary gland's role in producing saliva and amylase enzyme
Expanding on the small intestine's structural components, including the *Duodenum, Jejunum, and Ileum,* to facilitate a comprehensive understanding	The eighth page features a graphical depiction of the small intestine's structural components, facilitating a clear understanding of its divisions.	The eighth page comprehensively describes the digestive processes within the three small intestine sections: *Duodenum, Jejunum, and Ileum."*

As shown in Table 5, the validation outcomes from media experts demonstrate that the comic's content, presentation, and language meet the validity criteria at 90%, 93.9%, and 80%, respectively. These results affirm the comic's suitability for use in educational settings. The media expert validator also offers suggestions for product refinement, as summarized in Table 6.

An expert lecturer in Islamic integration conducted a thorough validation, resulting in scores translated into percentages to determine the product's feasibility relative to the predefined comic media feasibility criteria. The findings of this validation exercise are summarized in Table 7.

Table 7. Evaluation results from expert in integration

Evaluation Parameters	Percentage (%)	Category
Integration of Islamic Values	93,4	Very Valid

Table 8. Expert integration validator's comments and revision recommendations

Suggestion	Before	After
References to hadith are included at the bottom of each page	The hadith, translation, and commentary are presented to provide a comprehensive understanding.	The comic story is supplemented with additional hadith references on the page, providing further insight and context
Offering insights into the integration of Islamic values and moral lessons in the comic story	Not available	A supplementary page is added to elucidate the comic's pedagogical approach to integrating Islamic values across the domains of aqidah, syariah, and akhlak
Utilizing language that reflects Islamic values and principles.	In the speech bubble "*nah kan bandel, makanya makan itu jangan sambil bicara, tersedak kan*,"	Rephrasing the phrase to conform to Islamic values and teachings, "*Astagfirullah Akbar, makanya makan itu jangan sambil bicara, tersedak kan*,"

The validation outcomes from the expert in Islamic integration, as presented in Table 7, demonstrate a high degree of validity in integrating Islamic values, with a percentage of 93.3%. The validity indicators encompass the congruence of Quranic verses with the subject matter, the credibility of references employed, and the effective incorporation of Quranic verses into the comic narrative to enhance students' religiosity and faith development.

According to the biology teacher's assessment, the Islamic-Value-Integrated Comic on the Digestive System material meets the criteria for being highly practical, with a score of 85.71%. This outcome underscores the comic's potential as a valuable tool for biology education. To optimize its effectiveness, the teacher suggests simplifying the language used in the comic's dialogue to enhance students' understanding of the material embedded in the comic's storyline

The researcher collaborated with a biology teacher to conduct a small-scale trial to identify students with diverse abilities (high, medium, and low), drawing from a sample of 6 students in Class XI IPA 1.

Table 9. Results of small-scale trial

Respondent	Practicality index (%)	Criteria
Respondent 1	94	Very Practical
Respondent 2	84	Very Practical
Respondent 3	70	Practical
Respondent 4	78	Practical
Respondent 5	84	Very Practical
Respondent 6	74	Practical
Mean practicality score	**80,6%**	**Practical**

The results of a small-scale trial of instructional materials in the form of Islamic-Value-Integrated Comics on the Digestive System can be seen in Table 8. The total score percentage obtained from 6 respondents was found to have an average practicality of 80.67%. Based on the table, the practicality percentage of the Islamic-Value-Integrated Comics on the Digestive System indicates that it can be used practically.

At the next stage of the large-scale trial, the research aimed to determine how well students responded to the instructional material in comics. In this stage, the researcher introduced the product to the students and demonstrated how to apply the comics in learning. The results of the large-scale trial involving 28 students are as follows.

Table 10. Results of small-scale trial

Score Interval	Sample size	Practicality index	Criteria
81% - 100 %	11	82 % - 94 %	Very Practical
61% - 80%	14	66% - 80%	Practical
41% - 60%	2	60%	Adequately Practical
21% - 40%	0	21% - 40%	Not practical
0% - 20%	0	0% - 20%	Very not practical
Mean practicality score		**78,14 %**	**Practical**

Based on the results of the large-scale trial shown in Table 9, it can be seen that the average practicality score obtained was 78.142% from 28 respondents. Therefore, the results of this large-scale trial indicate that the Islamic-Value-Integrated Comics on the Digestive System are practical for use.

The dissemination stage was conducted in Class XI IPA 1, involving 28 students. This implementation aimed to obtain the effectiveness value of the developed product for the biology learning process on the digestive system material. The effectiveness value of the Islamic-Value-Integrated Comics on the Digestive System can be seen from the achievement of the learning implementation.

Table 11. Score-N-Gain

Data	Score	Score
N-Gain	0.63	Moderate

The research results show that comics can serve as a medium to facilitate students' understanding of learning materials, encourage students to be more interested in reading and learning, assist teachers and students in the biology learning process. However, some researchers acknowledge that to provide more profound learning outcomes for students, systematic and sustained efforts are required to meet students' learning needs. The significance of comics as a learning medium extends beyond their capacity to spark interest and support understanding of complex lesson concepts. This literature provides a solid foundation for the application of comics as an engaging and effective learning tool in various educational contexts (Yunarti et al 2023).

CONCLUSION

Based on the research and development of Islamic-Value-Integrated Comics on the human digestive system, it can be concluded that the comics have been successfully developed with high validity, practicality in learning, and effectiveness in improving students' conceptual understanding,

sparking interest, and supporting the understanding of complex lesson concepts. Additionally, the comics help students understand the integration of Quranic verses related to the digestive system and assist teachers in the biology learning process.

Trials of the Islamic-Value-Integrated Comics on the digestive system material received positive feedback from teachers and students. The results showed moderate improvement in students' conceptual understanding.

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