Development of Interactive Multimedia Based on Discovery Learning Enriched with HOTS-Oriented Islamic Concepts

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Abstract: The aim of this research is to determine the validity, practicality, and effectiveness of interactive multimedia based on Discovery Learning enriched with HOTS-oriented Islamic concepts for elementary school students. The development model used in this study was the PLOMP model, which consists of preliminary research, development or prototyping, and assessment phases. This study was conducted at an elementary school in Jambi City during the even semester of the 2023/2024 academic year. Data were collected using material validation instruments, instructional design validation instruments, multimedia validation instruments, Qur'anic interpretation validation instruments (Islamic studies), and student response instruments. The data analysis used descriptive statistics. The results showed that the developed multimedia falls into the "very valid" and "very practical" categories. Furthermore, the effectiveness analysis revealed a moderate gain score, indicating that the multimedia is effective in enhancing students' higher-order thinking skills. These findings suggest that the interactive multimedia developed is appropriate for use in elementary thematic learning to support 21st-century learning goals..

Keywords: Discovery Learning, HOTS, Interactive Multimedia Base, Islamic Concepts, Practicality, Validity

1. Introduction

The 21st century is marked by the rapid development of science and technology in various aspects of life, including in the world of education. The 21st century requires high-caliber human resources, where institutions with professional management will create superior results (Sepriyanti et al., 2022). The National Education Standards Agency (BSNP) has prepared the Indonesian National Assessment which emphasizes the competitiveness of Indonesian children in 21st century skills. Assessment is an integral part of the teaching and learning process, which has various meanings in education (Wiyaka et al., 2020). Assessment here is an activity to determine the abilities and weaknesses of each student in terms of cognitive development and social development, sensitive observation (Festiyed & Iswari, 2018). De Lange (1995, p. 96-103) in Turidho et al (2019) categorizes assessments into three levels: low level, medium level and high level. This high level is often called higher order thinking skills (HOTS).

Higher-Order Thinking Skills (HOTS) is the ability to provide more information, foster a critical thinking attitude, evaluate, have metacognitive thinking abilities, and solve problems (Rahmi et al., 2021). High-level Thinking Skills or what can be called HOTS include the processes of analysis (C4), evaluation (C5), and creating (C6) (Ulum et al., 2021). The use of HOTS questions in learning can train students to hone abilities and skills that are in line with the demands of the 21st century. HOTS test questions are given through stimulation, and the stimulus can come from current global issues such as technology, information, science, education, health and infrastructure (Hamdi et al., 2018).

The results of the PISA survey reveal that the thinking abilities of Indonesian children are still relatively low. One of the contributing factors is that Indonesian students are less trained in solving contextual problems, requiring intellectual activity, argumentation, and creativity in solving them, where the questions are typical PISA questions that estimate HOTS (Kusuma et al., 2017). Therefore, one of the demands in the Indonesian education curriculum at the secondary level is to embed HOTS in the teaching and learning process, which leads to assessment. HOTS is one of the main goals of education and is considered important for students to guide the development of their ideas (Wiyaka et al., 2020). Higher-order thinking requires a person to apply new information or knowledge they already have and manipulate information to reach possible answers in new situations.

Based on the data collected from several elementary schools in Jambi City, it can be concluded that students' higher-order thinking skills covering the aspects of analysis (C4), evaluation (C5), and creation (C6) are generally still in the low to moderate category. While some schools showed relatively balanced performance in analysis and creation skills, the evaluation aspect tended to score lower across most schools. The overall trend indicates that efforts to strengthen higher-order thinking skills among students are still needed, especially in promoting evaluative and creative thinking as essential components of 21st-century learning.

The immediate challenge for the 21st century is to integrate technology into learning. Education is expected to be able to instill and increase competition in the

digital era so that it can adapt to the rapid development of information technology through digital-based learning (Umayah & Riwanto, 2020). The digitalization of technology in the world of education has caused many changes in learning activities, starting with increasingly varied learning models, learning resources, and learning media (Anggraeni et al., 2019; Warsita, 2017). Learning media has an important role in the learning process because it can help teachers enrich students' knowledge (Ediyani et al., 2020). The use of media can make learning more effective so that students can learn about concepts that are abstract and difficult to understand (Nabilah et al., 2020). However, based on the results of information obtained from articles related to learning media, it is stated that the learning that is taking place is still less innovative in the use of learning media, especially those related to technology (Masturah et al., 2018; Oktaviana & Ramadhani, 2023; Prasetyo, 2017).

One of the media that can be used for technology-based learning is interactive multimedia. Interactive multimedia is a combination of several media elements involving integrated text, graphics, images, photos, audio, video, and animation, which can increase students' attractiveness and interest in learning. The main characteristic of interactive multimedia is that students can interact reciprocally with the media, and the media can provide responses to student activities. The characteristics of interactive multimedia can involve student participation in operating it so that students are more active in learning (Putra et al., 2019). In general, the benefits that can be obtained from using multimedia learning are that the learning process is more interesting and interactive, the quality of student learning can be improved, the teaching and learning process can be carried out anywhere and at any time, and students' learning attitudes can be improved (Nuraripin & Jaja, 2021).

In learning activities in elementary schools, the use of tools in the form of learning media can make abstract things more concrete and make the learning environment interesting, especially in thematic learning in elementary schools (Voogt et al., 2017). Hasibuan et al 2021 revealed that at the elementary school level, the implementation of integrated thematic learning is considered important. This is because elementary school children, especially those in the early grades, are still in the concrete operational thinking stage. Thematic learning can be interpreted as learning activities that integrate material from several subjects into one theme or discussion topic (Nuraripin & Jaja, 2021). This integrated learning departs from learning theory, which rejects the training/memorization (drill) process as the basis for forming students' knowledge and intellectual structure (Harfiyani et al., 2018). Integrated learning is a learning approach for elementary school students that develops soft skills and hard skills competencies, examines concepts, skills, and abilities developed in certain fields of study, and leads to relevant and meaningful learning conditions (Wardani & Sulistyawati, 2019).

In thematic learning, various types of intelligence can be developed holistically, where the thematic model does not only emphasize the cognitive domain but also includes the affective, psychomotor, and social domains. This theme is then explored from various points of view, both from the perspectives of science, the humanities, and religion, so that it can provide a more meaningful experience for students. An education system that integrates social sciences, natural sciences, and divine

sciences is very important to be included in the curriculum, starting from the elementary school level, as an effort to improve a society that upholds science and civilization with Islam as the main thrust (Rashed & Tamuri, 2022).

In accordance with the aim of education in Law Number 20 of 2003 concerning the National Education System, it is to develop the potential of students to become human beings who believe and are devoted to God Almighty, have noble character, are healthy, knowledgeable, capable, creative, independent, and become good citizens. democratic and responsible (Fitriyani et al., 2020). From these objectives, it can be concluded that the final results of education are not only limited to science and technology (IPTEK), but also faith and piety (IMTAK) (Fikri et al., 2022). However, in fact, the implementation of curriculum and materials in Indonesia has not yet instilled spiritual values (Suciati et al., 2022). This statement is also supported by Prastowo & Pambudi (2021) who reveal that education in Indonesia, especially general education, is more oriented towards industrial interests without strengthening religion, morals, and manners.

The issues mentioned above are consistent with the results of interviews conducted at one elementary school in the Kota Baru District of Jambi City, where it was revealed that students had never used interactive multimedia in thematic learning. The only media used in the learning process was a projector. This limitation is largely due to the restricted time available for teachers to explore and utilize various learning media. In addition, during the thematic learning process, integration between science and Islamic values is still rarely implemented by teachers.

Similarly, in another elementary school located in the Alam Barajo District of Jambi City, the learning media used is limited to conventional teaching aids. Teachers rely solely on these aids because of limited classroom space, which prevents the use of other tools such as projectors. Moreover, the available teaching aids are in poor condition and not suitable for use. Consequently, teachers expressed strong support for the development of multimedia learning tools that could enhance the learning process, save time and costs, and overcome spatial limitations in the classroom.

The implementation of integrated learning in elementary schools still leaves many obstacles (Ika et al., 2021). To reduce these obstacles, learning media are needed that are structured based on the steps of a learning model. The learning model that can be used is the discovery learning model. This model involves students learning actively by uncovering or discovering concepts or principles themselves in the learning process, where teachers provide opportunities for students to discover concepts, theories, rules, or understanding through examples encountered in everyday life (Lestari et al., 2021; Ulya et al., 2021).

Based on the presentation of data from research conducted by previous researchers and the results of initial research at the location regarding learning in schools as described, it is important and urgent for researchers to carry out research related to the development of the validity and practicality of interactive multimedia based on discovery learning with the enrichment of HOTS-oriented Islamic concepts. It is important because science and Islam are inseparable parts whose material must be taught in the learning curriculum in elementary schools so that students starting from elementary school are introduced to the concepts of science and the truths

believed to exist in Islam. In this way, students' high-level thinking abilities can also be improved through the integration of science and Islam in integrated science learning. Urgent, because the current era is a digital era where learning requires digital-based learning, the characteristics of 21st century learning require creativity, critical thinking, extensive communication between students and teachers, and learning that is collaborative in nature. Based on the principle of the importance of something that is urgent, this research is done. The aim of this research is to determine the validity and practicality of interactive multimedia based on discovery learning and the enrichment of hot-oriented Islamic concepts for elementary school students.

2. Method

This study is a type of development research employing the PLOMP development model. The product developed is interactive multimedia based on discovery learning enriched with HOTS-oriented Islamic concepts, designed for elementary school students. The object of this research is the interactive multimedia covering two basic competencies: (1) explaining the solar system and the characteristics of its members (KD 3.7), and (2) creating a model of the solar system (KD 4.7).

The development process of the interactive multimedia followed the PLOMP model, which consists of three main phases: (1) preliminary research, (2) development or prototyping phase, and (3) assessment phase (Plomp & Nieveen, 2010). This research was carried out through all three stages, culminating in the assessment of the validity, practicality, and effectiveness of the developed product. The development flow in this research can be seen in Figure 1.

Initially, the multimedia product was designed and subjected to formative evaluation. It was validated by a team of experts, responded to by students, and then tested in an actual learning environment. The expert validators included specialists in science education content, instructional design, learning multimedia, Qur'anic interpretation (Islamic studies), and educational evaluation instruments.

The practical implementation involved both one-on-one and small group evaluations conducted in one of the elementary schools in Jambi City during the even semester of the 2023/2024 academic year. In the one-on-one evaluation, three sixth-grade students with varying ability levels were selected, while the small group evaluation involved nine students with similarly diverse capabilities.

Following the validation and practicality testing, the effectiveness of the interactive multimedia was also measured by implementing it in classroom learning and observing its impact on students' understanding and learning outcomes related to the targeted competencies.

Descriptive statistical analysis was employed in this study and presented through tables and graphs. Data were weighted using a Likert scale, and product validity scores were calculated using a percentage-based technique, as shown in Equation 1.

$$NP = \frac{R}{SM} \; x \; 100\% \; .... \; (1)$$

Information:
NP   = Percentage value
R   = Assessment score
SM   = Total score

After all the data has been processed and analyzed, the next step is to group the validation results and conclude them based on predetermined criteria. The product validity score criteria are presented in table 1.

Table 1. Interpretation of Product Validity

Criteria	Criterion Interval
Very Worth It	85% - 100%
Worthy	70% - 84%
Decent Enough	60% - 69%
Not Worth It	50% - 59%
Not feasible	<50%

(Riduwan, 2012)

The product practicality weight value is calculated based on the percentage technique as written in equation 2.

$$P = \frac{f}{N} \; x \; 100 \; .... \; (2)$$

Information:
P   = Final score
f   = Assessment score
N   = Total score

After all the data has been processed and analyzed, the next step is to group the practical results and conclude them based on predetermined criteria. The product practicality score criteria are presented in table 2.

Table 2. Interpretation of Product Practicality

Criteria	Criterion Interval
Very Practical	80% < x ≤ 100%
Practical	60% < x ≤ 80%
Quite Practical	40% < x ≤ 60%
Less Practical	20% < x ≤ 40%
Impractical	0% < x ≤ 20%

(Riduwan, 2012)

The overall multimedia feasibility assessment is carried out using the formula in equation 3, and the multimedia feasibility analysis can be seen in table 3.

$$x_t = \frac{\sum xi}{N} \; .... \; (3)$$

Table 3. Interpretation of multimedia feasibility

Interval Mean Score	Interpretation
1.00 – 2.49	Not feasible
2.50 – 3.32	Not worth it
3.33 – 4.16	Worthy
4.17 – 5.00	Very worthy

Data analysis of the effectiveness of high-level thinking skills can be found using the following formula:

$$N_{Gain} < g > = \frac{S_{Post} - S_{Pre}}{S_{Max} - S_{Pre}} \ldots\ldots\ldots\ldots (3)$$

Information:

N_{Gain}	: Gain Value
S_{pre}	: Pretest Value
S_{Post}	: Posttest Value
S_{max}	: Maximum Score

Table 4. Interpretation of Effectiveness Questionnaire

Criteria <g>	Criteria Interval
High	$<g> \geq 0,7$
Medium	$0,3 \leq <g> < 0,7$
Low	$<g> < 0,3$

(Hake, 1999)

3. Result and Discussion

Several activities were conducted, including prototype design, formative evaluation, and prototype revision. The following section explains the results of each stage of these activities. The interactive multimedia was designed with a structured layout consisting of a home page scene display, a home menu, and Al-Qur'an verses related to the universe, which integrate learning objectives, learning materials, HOTS activities, practice exercises, and evaluation components. The design is illustrated in the following figure.

Figure 1. Home Page Scene Display

This figure shows the home page of the interactive multimedia, designed with an engaging space-themed interface. The page includes the multimedia title, input fields for the user's name and school name, and a login button that allows users to access the learning content.

Figure 2. Home Page Scene Display

This figure presents the main menu of the interactive multimedia after the user logs in. The menu consists of interactive icons representing learning objectives, learning materials, HOTS activities, practice exercises, and evaluation. This layout facilitates easy navigation and supports independent learning.
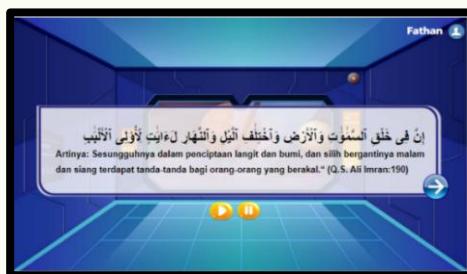
Figure 3. Al-Qur'an Verse

This figure illustrates the integration of a Qur'anic verse related to the learning material. The verse is presented along with its translation to strengthen Islamic values and to conceptually connect scientific content with Islamic teachings, thereby promoting meaningful and holistic learning.

Formative evaluation refers to tesser diagrams to ensure quality interactive multimedia design results. The stages consist of self-evaluation of the prototype, expert review, and then field trials in one-to-one and small group form. At the self-evaluation stage, the author evaluates the product being developed through self-evaluation. The author found several errors and shortcomings including errors in typing words, the preparation of SPOK is not correct, there are still foreign terms that are not italicized, there are still irregular numbers and table numbers, the transitions are not correct, and there are still hyperlinks that don't work. Based on the errors and shortcomings that the author found, the prototype was then revised, and it was confirmed that the prototype was ready to be validated by experts.

After the self-evaluation stage, the next step is validation by experts. Validators consist of science education material experts, learning design experts, learning multimedia experts, Al-Qur'an interpretation experts (Islamic studies), and instrument evaluation experts. Material validation instruments, learning designs, and learning multimedia were obtained from sources or references (BNSP, Ministry of National Education, and research results that have been tested and in IPR). The instrument is modified according to needs and is only consulted or reviewed by the supervisor. Meanwhile, for instruments validating interpretations of the Qur'an, student responses are carried out by instrument evaluation experts to validate

products and question validation to see cognitive abilities in the domains of analysis (C4), evaluation (C5), and creation (C6). The results of the validity test can be seen in the table below:

Table 5. Validation Results of Al-Qur'an Interpretation Instruments

Validation Aspect	Category
Material Coverage	Proper to use
Language Presentation	Proper to use
Contextual Nature	Proper to use

Based on the results of the validation calculations for the Tafsir Al-Qur'an instrument, which include aspects of material coverage, language presentation, and contextual nature, the results obtained show that the validation instrument for Tafsir Al-Qur'an is suitable for use.

Table 6. Material Expert Validation Results

No	Aspect	Mark (%)	Category
1	Content Eligibility	91	Very Worth It
2	Feasibility of Presentation	93	Very Worth It
3	Language Eligibility	91	Very Worth It
4	Contextual Assessment	100	Very Worth It
	Average	93.75	Very Worth It

Based on the results of material expert validation calculations in Table 5, the content feasibility aspect received a score of 91% in the very feasible category. The presentation aspect received a score of 93% in the very appropriate category, the language feasibility aspect received a score of 91% in the very appropriate category, and the contextual assessment aspect received a score of 100% in the very appropriate category. So it can be concluded that the material validation results are very suitable for use, with a percentage of 93.75%.

Table 7. Validation Results from Learning Design Experts

Aspect	Mark (%)	Category
KI/KD	80	Worthy
Objective	80	Worthy
Material	80	Worthy
Example	80	Worthy
Exercise	80	Worthy
KP	80	Worthy
Summary	80	Worthy
Self-assessment	80	Worthy
Evaluation	80	Worthy
Compiler	80	Worthy
Reference	80	Worthy
Average	80	Worthy

Based on the results of validation calculations from learning design experts in table 7, interactive multimedia is suitable for use with a percentage of 80%.

Table 8. Learning Multimedia Validation Results

Domain	Indicator	Nilai	Category
Multimedia Content/Materials	Guide and Information	4.50	Very Worth It
	Multimedia Content/Materials	4.67	Very Worth It
	Evaluation	4.13	Worthy
Multimedia Construction	Guide and Information	4.40	Very Worth It
	Program Performance	4.67	Very Worth It
	Systematics	4.50	Very Worth It
	Aesthetics	4.45	Very Worth It
Average		4.46	Very Worth It

Table 8 shows the results of multimedia learning validation, which is divided into two domains, namely multimedia content/material and multimedia construction. The multimedia content/material domain consists of guides and information, which received a score of 4.50 in the very appropriate category; multimedia content/material, which received a score of 4.67 in the very appropriate category; and evaluation, which received a score of 4.13 in the appropriate category. Meanwhile, the multimedia construction domain consists of four aspects: guidance and information, which received a score of 4.40 in the very feasible category; program performance, which received a score of 4.67 in the very feasible category; systematics, which received a score of 4.50 in the very feasible category; and aesthetics, which received a score of 4.45 in the very worthy category.

Table 9. Validation Results by Qur'an Interpretation Experts (Islamic Studies)

Aspect	Mark (%)	Category
Material Coverage	93	Very Worth It
Language Presentation	100	Very Worth It
Contextual Nature	100	Very Worth It
Averagee	97.66	Very Worth It

Table 9 shows the validation results by Qur'an exegetes (Islamic studies), which consist of three aspects. The material coverage aspect received a score of 93% in the very appropriate category, the language presentation aspect received a score of 100% in the very appropriate category, and the contextual essence aspect received a score of 100% in the very appropriate category.
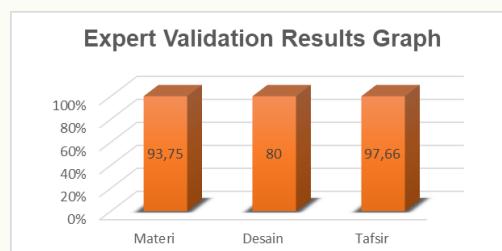

Figure 4. Graphic of Material, Design and Interpretation Expert Validation Results

Based on Figure 4, information is obtained that the assessment on the three aspects shows a percentage of 93.75% for material validation in the very feasible category, 80% for design validation in the feasible category, and 97.66% for validation of interpretations in the very feasible category. Furthermore, validation from multimedia experts can be seen in Figure 5.
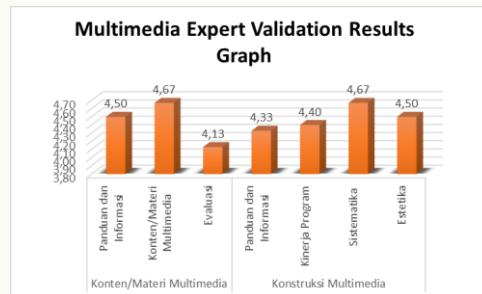

Figure 5. Graph of Multimedia Expert Validation Results

Based on Figure 5, information obtained from validation results from multimedia experts in the guidance and information aspect is in the very feasible category with a score of 4.50; in the content/material aspect, it gets a score of 6.47 in the very decent category; the evaluation aspect gets a score of 4.13 in the decent category; the guidance and information aspect gets a score of 4.33 in the very decent category; the program performance aspect got a score of 4.40 in the very decent category; the systematic aspect got a score of 4.67 in the very decent category; and the aesthetic aspect got a score of 4.50 in the very decent category.

Next is the one-to-one evaluation stage, namely the product trial stage with three students with high, medium, and low abilities. At this stage, practicality was measured according to three students. The results of this stage can be seen in table 12 below.

Table 10. Results of the one-to-one evaluation stage

No	Student Name	Cognitive Level	Mark (%)	Category
1	AA	High	93	Very Practical
2	BA	Currently	82	Very Practical
3	CA	Low	90	Very Practical
	Average		88.33	Very Practical

Based on Table 10, the results show that interactive multimedia obtained scores of 93%, 82%, and 90%, respectively, in the very practical category. After that, the final stage is small group evaluation, namely the product trial stage, which was carried out on nine students with high, medium, and low abilities. At this stage, the practicality and effectiveness of the product are tested. The results of this stage can be seen in table 10 below.

Table 11. Results of the small group evaluation stage

No	Student Name	Cognitive Level	Nilai (%)	Category
1	AA	High	98	Very Practical
2	AB	High	80	Very Practical

3	AC	High	86	Very Practical
4	BA	Currently	84	Very Practical
5	BB	Currently	88	Very Practical
6	BC	Currently	83	Very Practical
7	CA	Low	94	Very Practical
8	CB	Low	91	Very Practical
9	CD	Low	97	Very Practical
	Average		89	Very Practical

Based on the results of the small group evaluation test in Table 11, which was carried out on 9 students with different abilities, it can be concluded that interactive multimedia received the very practical category.

To see the effectiveness of the interactive multimedia products used on participants' high-level thinking skills, the gain value <g> is sought with the results shown in Table 12 below.

Table 12. Results of the Effectiveness of Outer Space Exploration Materials

No	Subtheme	Variables	Value	Gain Value	Criteria
1	Subtheme 1	S_{post}	2060	0.37	Medium
		S_{pre}	1800		
		S_{max}	2500		
2	Subtheme 2	S_{post}	1930	0.46	Medium
		S_{pre}	1440		
		S_{max}	2500		
3	Subtheme 3	S_{post}	1855	0.47	Medium
		S_{pre}	1455		
		S_{max}	2300		
	Rata-rata			0.44	Medium

Based on Table 12 above, it can be seen that the gain value obtained for each sub-theme has an average value of 0.44 with a moderate category. This means that the interactive multimedia developed has moderate effectiveness in improving students' high-level thinking skills.

The assessment phase is an important stage in the Plomp model development research. At this stage, the product that has been developed and tested in a real context to assess the effectiveness, efficiency, and acceptability of its use in the field. The assessment stage is in the form of learning effectiveness that can be assessed from the success achieved by students in demonstrating their individual abilities, including the intelligence and skills they have acquired (Zuriyah, 2016). Effective learning involves efforts to guide students towards mastering certain skills as learning goals, which are measured through grades and reflect the level of achievement of learning goals. Improvement in learning outcomes can be influenced by the use of learning media during the learning process. The basic theory underlying the use of learning media is Bruner's theory, which states that the use of media in learning will enrich students' learning experiences. According to Bruner, there are three main levels in the learning process that are interconnected in an effort to gain

new experiences, namely direct experience (enactive), visual experience (iconic), and abstract experience (symbolic) (Muhstyo, 2008).

The use of interactive multimedia media based on discovery learning with the enrichment of Islamic concepts, such as depictions of exploring outer space in science learning, is considered interesting and more effective and efficient because of its accessibility which can be accessed online via devices such as cellphones or laptops. This allows students to access materials flexibly, whenever and wherever they need them, and provides a more interactive and in-depth learning experience through various multimedia elements, such as images, animations, and videos. This can increase student involvement and understanding of the subject matter, thereby supporting the achievement of learning objectives more effectively. Wijayanto et al. (2021) stated that media is a source of learning. Therefore, in general, learning media can be interpreted as anything, be it humans, objects, or events, that allows students to gain knowledge and skills.

The purpose of validation is to obtain recognition and validation of the suitability of the product to needs so that it is suitable for use in learning. The results of data analysis from validity tests carried out on aspects of material substance, which include appropriateness of content, appropriateness of presentation, appropriateness of language, and contextual assessment of interactive multimedia, obtained a valid category. Aspects of learning design, which include aspects of title, KI/KD, learning objectives, materials, example questions, exercises, summaries, self-assessments, evaluations, organizers, and references in interactive multimedia, received the appropriate or valid category. The multimedia aspect of learning, which includes the multimedia content/material domain, which includes information guides, content, and evaluation, and the multimedia construction domain, which includes information guides, program performance, systematics, and aesthetics in multimedia, received a very feasible and valid category. Aspects of Qur'an interpretation, which include material, language, and contextual nature in multimedia, received the very appropriate or valid category. The overall results from the validation of interactive multimedia based on Discovery Learning with the Enrichment of Islamic Concepts Oriented to HOTS (High Order Thinking Skills) were obtained in the feasible/valid category.

Based on the validation results obtained in this research, it can be concluded that Discovery Learning-based interactive multimedia with HOTS (High Order Thinking Skills)-oriented Islamic Concept Enrichment is in the very feasible/valid category. Relevant research was also conducted by (Putra & Afrina, 2023) who carried out validation tests related to generationally-based interactive multimedia learning for fifth-grade/MI students. The validation results of media experts with a score of 71 in the good category, material experts with a score of 86.6 in the very good category, and learning experts with a score of 80 in the very good category indicate that genial-based interactive learning multimedia is suitable for use. Rulismi et al (2023) also validated the development of multimedia interactives to improve early children's language skills. The research results show that the interactive multimedia developed is suitable for use in improving language skills in early childhood. This conclusion is based on the results of limited and extensive testing. Rizqa et al (2023) also carried

out validation with the title The Development of Interactive Multimedia Learning in Vocational Schools. The research results showed that the development of interactive multimedia-based learning media was assessed as valid based on the content by 5 experts at 91.80%. Ernawati et al (2023) conducted research on the development of science-based interactive multimedia. The research results are in the form of PowerPoint-based interactive multimedia for science learning, which was developed in five stages. The validation expert gave a validity value of 73.14% in the valid category.

After the interactive multimedia is declared valid by the validator, a practicality test is then carried out. The practicality test aims to determine the practicality of the multimedia being developed. This research was carried out through a practicality test by class teachers and students. The results of the data analysis from the practicality test were obtained from an assessment of ease of use, time efficiency, and the benefits of multimedia in learning activities. The results of the practicality test by the class teacher are in the very practical category, as well as for students in the very practical category.

Based on the results obtained, it can be concluded that Discovery Learning-based interactive multimedia with HOTS (High Order Thinking Skills)-oriented Islamic Concept Enrichment is in the very practical category both in terms of appearance, ease of use, efficiency of learning time, creativity, and benefits. Related research was also conducted by Sumarwi et al (2023) who conducted a practicality test entitled Development of Interactive Multimedia Learning Media on Alternative Energy to Improve the Understanding of 3rd Grade Elementary School Students. The research results show that the validity of alternative energy interactive multimedia obtained a validity percentage of 85% (very valid). The practicality of alternative energy interactive multimedia is 95% (very practical).

The results of this study are in line with the research conducted by Wahyuni et al. (2017), which focused on the development of interactive multimedia modules based on e-learning for the topic of quantities and units in high school. The module was validated by experts with a validation score of 4.1 and was deemed suitable for use in learning activities. Audience validation also indicated that the module was effective, and student learning outcomes showed high achievement, with an average score of 87.14, consisting of 67.26 in the cognitive domain, 92 in the psychomotor domain, and 94.92 in the affective domain.

The development of technology in 21st-century learning requires both educators and learners to possess adequate technological literacy. In this context, the utilization of information technology through interactive multimedia that integrates text, images, audio, video, and animation plays an important role in enhancing learning interaction, expanding access to information, and promoting effective and efficient self-directed learning (Angelysca & Kusnadi, 2024). In line with this demand, it is necessary to update learning methods and media so that Islamic values are not presented in a rigid or formalistic manner, but instead delivered in a more engaging, dynamic, and contextually relevant way for learners (Prihatin et al., 2025). Furthermore, the implementation of the discovery learning model demonstrates that

each stage of the model contributes to the development of Higher Order Thinking Skills (HOTS), enabling learners to engage in analytical and reflective thinking beyond basic conceptual understanding (Aliyawinata et al., 2021).

4. Conclusion

Based on the validation results, it can be concluded that the Discovery Learning-based interactive multimedia enriched with HOTS-oriented Islamic concepts falls into the "very valid" category, indicating its suitability for measuring students' Higher Order Thinking Skills (HOTS). In terms of practicality, the multimedia is also classified as "very practical," showing that it can be effectively implemented in classroom settings. Furthermore, the effectiveness analysis showed a gain score average of 0.44, which falls into the moderate category. This suggests that the developed interactive multimedia has a moderate level of effectiveness in enhancing students' higher-order thinking skills. Although the number of participants in this study was limited, the results offer valuable insights and serve as a strong foundation for future research involving a larger sample size and the application of similar multimedia tools across different subject materials.

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