Journal of Educational Sciences
Journal homepage: https://jes.ejournal.unri.ac.id/index.php/JES
P-ISSN 2581-1657
E-ISSN 2581-2203

Development of A Learning E-Module Based on The OIDDE Learning Model on The Material on The Classification of Living Things in Class VII of Muhammadiyah 08 Junior High School, Kota Baru

Hanik Fitrotul Azizah*, Atok Miftachul Hudha, Fendy Hardian Permana
Faculty of Teacher Training and Education, Muhammadiyah Malang University, Malang, Indonesia, 65113

ARTICLE INFO

Article history:

Received: 15 Jan 2026
Revised: 22 Jan 2026
Accepted: 27 Jan 2026
Published online: 20 Feb 2026

Keywords:

E-Module,
OIDDE Learning Model,
Classification of Living Things,
ADDIE Model,
Research and Development

* *Corresponding author:*

E-mail: atok@umm.ac.id

Article Doi:

https://doi.org/10.31258/jes.10.2.p.3450-3466

A B S T R A C T

The demands of 21st-century education require integrating technology and innovative learning models. This study aims to develop a valid and practical e-module based on the OIDDE (Orientation, Identify, Discussion, Decision, and Engage in Behavior) learning model for living creature classification material in class VII at Muhammadiyah Junior High School 08 Batu City. The ADDIE (Analysis, Design, Development, Implementation, Evaluation) model guided the development process. Data were collected through validation sheets from material, media, and language experts, and practicality questionnaires completed by educators and students. The e-module was validated by six experts and tested on 26 students. Validation results showed mean scores of 91.5% for material, 95.8% for media, and 100% for linguistic aspects, indicating very high validity. Practicality tests yielded scores of 95% from educators and 90.2% from students, demonstrating very high practicality. These results indicate that the OIDDE-based e-module is highly valid and practical, making it a viable alternative teaching material for science learning. It is recommended that further development expand the module's features and content scope to enhance its educational impact.

1. Introduction

The 21st century has brought significant changes in various fields, including education. Every individual is required to master competencies and skills to compete globally. The world of education requires competent human resources with mastery of the 4Cs (Critical Thinking, Creativity, Collaboration, and Communication). The use of technology is crucial to meeting the demands of

today's education era (Aripin et al., 2020; Sari & Atmojo, 2021). To meet the demands of 21st-century skills, the classification of living things, as part of biology, is essential for teaching at the junior high school (SMP) level. This material has a unique characteristic: grouping living things based on shared characteristics to facilitate identification and study (Hayati, 2022; Mustaqimah et al., 2023). The rapid development of biology requires educators to present material effectively, and students to possess strong communication skills (Ardelia & Juanengsih, 2021).

The implementation of biology learning in schools still faces challenges, including the broad nature of the classification of living things, which is considered boring (Faturrahman & Ningsih, 2023). This material's characteristics make this subject less appealing because it is perceived as rote with concepts difficult for students to grasp, often neglected during group work (Azizah & Alberida, 2021; Suryani & Kusmiyati, 2025). Furthermore, teaching methods, still dominated by conventional approaches and the limited use of media, such as worksheets and textbooks, are considered ineffective and less motivating (Kurniawan & Hasanah, 2022; Paat et al., 2022). This low quality of learning is influenced by both internal student factors (attitude and time management) and external factors, such as suboptimal utilization of resources (Sasmita et al., 2023). As a result, the use of less innovative media leads to student passivity and lack of interest in learning (Permatasari et al., 2025). Therefore, the role of educators as facilitators is crucial in encouraging the use of resources and selecting appropriate media to increase engagement, attract interest, and maintain relevance to students' daily lives (Basyori, 2025).

Based on initial observations through interviews with seventh-grade science teachers at Muhammadiyah 08 Junior High School, Batu City, on August 11, 2025, it was discovered that educators needed interactive teaching materials in science lessons, particularly for the classification of living things. This need was driven by several challenges. First, the classification of living things was considered difficult and rote-based due to its abundance of scientific terminology. Furthermore, learning activities, which should be visual and contextual, were still limited in printed textbooks. However, this material requires clear visualizations and concrete examples so students can effectively observe, compare, and classify living things. Although school facilities and infrastructure are adequate, they are not utilized optimally. As a result, learning activities remain teacher-centered, student participation is low, and conceptual understanding is suboptimal. This situation indicates a lack of teaching materials, media, and resources, which are ineffective in conveying information and stimulating students (Lestari et al., 2025). Therefore, more innovative learning media are needed.

Developments in digital technology can provide a solution for creating innovative learning media, one of which is the e-module. E-modules are digital, non-printed teaching materials designed for independent study. They present interactive content with multimedia (images, audio, video, animation) for ease of use (Widiastuti, 2021; Fujiarti et al., 2024). Their advantages include overcoming limitations of space and time, fostering learning motivation, and providing evaluations that help educators measure mastery (Mutmainnah et al., 2021). In the creation process, Canva can facilitate educators in creating engaging e-module designs (Putri & Erita,

2023). The use of Heyzine Flipbook, which can convert PDF files into interactive flipbooks with an attractive display through images, audio, video, and hyperlinks, makes it easier for students to access and learn independently (Nabila et al., 2021).

In addition to using innovative learning media, the use of appropriate learning models is also a determining factor in learning success. Of the various existing models, the OIDDE (Orientation, Identify, Discussion, Decision, and Engage in Behavior) learning model is very suitable for science learning emphasizing scientific stages. The stages of the OIDDE learning model train students in conducting observations, identifying problems, discussing collaboratively, making decisions, and implementing ethical behavior. Thus, learning activities become more meaningful and student-centered. This model encourages active student involvement that not only understands concepts but also forms ethical attitudes and behaviors (Hudha et al., 2016; Hudha et al., 2018; Hudha, 2020; Hudha et al., 2021; Hudha et al., 2024). Through this model, students are given space to explore problems, discuss solutions, make decisions, and apply them in real-life ethical behavior (Hudha et al., 2016; Hudha et al., 2018; Hudha 2020; Hudha et al., 2021; Hudha et al., 2024).The development of e-modules based on the OIDDE learning model is unique and different from previous research. Research conducted by Nurjayanti & Mustaji (2021); Azizah et al. (2022); Kaniyah et al. (2022); Azizi et al. (2024) developed e-modules but with different approaches and models than the OIDDE learning model. Meanwhile, research conducted by Ma'rifatillah et al. (2019); Lesmana et al. (2020); Sartina et al. (2022) applied the OIDDE model to improve 21st-century skills, not on developing teaching materials aligned with its characteristics and syntax. Therefore, research on the development of e-modules based on the OIDDE learning model is still lacking.

The development of ethical behavior in students through the engage-in-behavior stage makes this e-module focus not only on cognitive aspects but also on affective aspects. Unlike previous research that only developed e-modules with other models or implemented the conventional OIDDE model, this study specifically developed a learning e-module that systematically integrates all stages of the OIDDE learning model. The e-module was developed in an engaging, interactive, and accessible manner, and presents material on the classification of living things for Grade 7 that is relevant to the Merdeka Curriculum. This research aims to develop a valid and practical e-module based on the OIDDE learning model for teaching classification of living things to Grade 7 students at Muhammadiyah 08 Junior High School, Batu City, integrating all stages of the OIDDE model to enhance both cognitive and affective learning outcomes.

2. Methodology

This research is a type of research and development (R&D) that aims to produce a specific product, namely a learning e-module on the material of classification of living things for grade VII. The development model used is the ADDIE model (Analysis, Design, Development, Implementation, and Evaluation). This model was chosen because it is systematic, flexible, and suitable for the development of

learning media (Judijanto, et al., 2024). The analysis stage is carried out by assessing the needs of schools and educators and conducting a curriculum analysis to identify problems and learning needs as a basis for developing the e-module. The design stage is carried out by preparing a blueprint or basic framework that maps the visual appearance and substance of the material in the e-module based on the OIDDE learning model. In the development stage, the complete product is compiled, both in terms of content structure and appearance according to the design that has been made. The product is then validated by expert validators (materials, media, language). This validation stage aims to obtain input and suggestions as a basis for product improvement. Next, a limited trial was conducted with students to measure the product's practicality and identify educator and student responses after using the e-module in learning activities.

This study involved 26 randomly selected seventh-grade students at Muhammadiyah 08 Junior High School, Batu City, to test the product's practicality and identify educator and student responses to the OIDDE-based e-module used in the learning process. The study used a combination of qualitative and quantitative data. Qualitative data were obtained from observations of the learning process, educator responses, suggestions from expert validators, and student responses regarding the e-module's readability, appearance, and ease of use. Quantitative data were obtained from a validation questionnaire administered to expert validators and questionnaires containing educator and student responses using a Likert scale. The research instrument, a questionnaire completed by expert validators, educators, and students, was then analyzed using descriptive statistics. The analysis of the validity and practicality of the e-module was carried out by calculating the percentage of the score obtained against the maximum score, which was then interpreted based on the feasibility and practicality criteria in the form of percentage categories to determine the level of validity and practicality of the product.

3. Results and Discussion

Analyze

This stage aims to identify problems and needs in the learning process as a basis for developing the e-module. The analysis began with an assessment of the school's and educators' needs through a direct interview with a seventh-grade science teacher at SMP Muhammadiyah 08 Kota Batu, Ms. Feti Tunjungsari, S.Pd., on August 11, 2025. The findings revealed that the primary cause of students' lack of focus was the conventional teaching method, which relied on printed materials and the lack of technology integration in learning, despite adequate school facilities and infrastructure. Further interviews indicated that educators needed innovative teaching materials that integrated technology to meet 21st-century demands, as well as learning activities that specifically trained students in problem-solving and decision-making related to everyday life issues. Based on the results of a direct interview with the seventh grade science teacher, Mrs. Feti Tunjungsari, S.Pd., it is known that SMP Muhammadiyah 08 Batu City in the 2024/2025 academic year has

implemented the independent curriculum at all grade levels in accordance with BSKAP 046/H/HR/2025. This analysis aims to gather information as a basis for developing an e-module. The results of the analysis show that the science learning approach in Phase D is applied in an integrated manner, which is in line with the nature of complex and interrelated natural phenomena, thus encouraging students to build a holistic and meaningful understanding. Based on the curriculum framework, the material on the classification of living things included in the Learning Outcomes (CP) of the even semester is considered very relevant to be developed into an e-module based on the OIDDE learning model. The development of this e-module is designed in response to the need for more interactive, contextual, and technology-based learning for seventh grade junior high school students. Once the material has been determined, the next step is to determine the e-module content that aligns with the Learning Outcomes (CP) and Learning Objectives (TP), and to identify the necessary supporting components, including material sources, supporting software, validation test instruments, and practicality testing.

Design

The design stage is the initial product design phase, which serves as the basis for e-module development. This stage begins with gathering various references or sources, such as textbooks, teaching modules, and websites related to the classification of living things for Grade VII that align with the Merdeka Curriculum. Next, the product design is developed by drafting an e-module, consisting of several components: a cover page, user manual, learning outcomes and objectives, learning materials, lead questions, learning videos, and comprehension test questions. The e-module is visually designed using Canva and converted into an interactive format via a flipbook heyzine.The final stage is the development of expert validation instruments (materials, media, language) and practicality testing. First, the expert validation sheet, which includes: (a) material expert validation with assessment indicators on the content suitability aspect (material suitability with KD, accuracy, currency, and ability to stimulate curiosity) and presentation suitability aspect (presentation technique); (b) media expert validation with assessment indicators on media suitability (ease and simplicity, size, and attractiveness); and (c) language expert validation with assessment indicators on language suitability (accuracy of language use, suitability with student development, and suitability with language rules). Second, the practicality test sheet, which consists of: (a) educator response questionnaire to assess the design and visual communication aspect (appearance appeal), material and learning aspect (content suitability with material and learning objectives, ease of understanding concepts), and language aspect (language clarity and accuracy of linguistic elements); and (b) student response questionnaire to measure the attractiveness and interest in the e-module, material clarity and ease of understanding, as well as the effectiveness and involvement of students in the learning process.

Development

At this stage, the e-module will be fully developed according to the previously created draft. The OIDDE-based e-module on the classification of living things is

structured according to the learning objectives in Phase D of the Merdeka Curriculum. The e-module was created using Canva, which was uploaded to a flipbook heyzine for interactive display. This e-module contains pages containing user instructions, learning outcomes and objectives, learning materials, prompt questions, learning videos, and comprehension test questions.

After the e-module was developed, product validation was conducted to measure its validity. Product validation was conducted by six expert validators: two material experts, two media experts, and two language experts. The expert validators not only provided assessments but also provided comments and suggestions that were used as revisions to refine the e-module.The material expert validation was conducted by Dra. Sri Wahyuni, M.Kes. and Drs. Wahyu Prihanta, M.Kes., who assessed the appropriateness of the content and presentation. The results showed a feasibility percentage of 87.5% (very valid) from the first validator and 95% (very valid) from the second validator. The validators provided several suggestions, such as improving the concept map, updating the bibliography, adding a determination key, refining the illustrations, and rechecking the sequence and clarity of points in the basic classification of living things.Media expert validation was conducted by Fuad Jaya Miharja, S.Pd., M.Pd. and Ahmad Fauzi, S.Pd., M.Pd., focusing on aspects of ease of use, simplicity, size, and attractiveness of the design. The validation results showed a 97.5% (very valid) from the first validator and 93% (very valid) from the second validator. The suggestions focused on technical improvements such as adjusting the numbering of out-of-order images.

Linguist validation was conducted by Dwi Setyawan, S.Pd., M.Pd. and Dra. Siti Zaenab, M.Kes., evaluated the accuracy of language use, suitability to the students' developmental level, and adherence to Indonesian language rules. The results were very positive, with the first validator giving a perfect 100% (very valid) and the second validator giving a 100% (very valid) score. Suggestions included improving the video presentation (it is recommended that the video not be linked directly to YouTube to avoid ad interruptions, but rather be uploaded to a platform like Google Drive). Several wording corrections were made to make the e-module more communicative.

Implementation

After the e-module was declared feasible by the validators, consisting of material experts, media experts, and language experts, a limited trial was conducted involving one educator, Ms. Feti Tunjungsari, S.Pd., a Grade 7 science teacher, and 26 Grade 7 students at SMP Muhammadiyah 08 Batu City. The sample was randomly selected to represent all Grade 7 students at SMP Muhammadiyah 08 Batu City. The purpose of this trial was to determine the responses of educators and students after using the e-module in classroom learning activities. Through this stage, the practicality level of the developed e-module can be determined. This limited trial was conducted in one meeting (3JP) on December 12, 2025, offline at SMP Muhammadiyah 08 Batu City by following all stages of the OIDDE learning model. After the learning activities using the e-module based on the OIDDE learning model, educators and students filled out a practicality test instrument to be

used as evaluation material for product improvements. The results of the practicality test analysis by educators obtained an average value of 3.8 with a percentage of 95% and included in the very practical category, while the results of the practicality test analysis by students obtained an average value of 36.1 with a percentage of 90.2% and included in the very practical category.

Evaluation

The evaluation phase was conducted continuously at all stages. During the analysis phase, the needs assessment revealed that science teachers at SMP Muhammadiyah 08 Batu City needed innovative teaching materials that integrated technology in line with the demands of 21st-century learning. During the design phase, an e-module based on the OIDDE learning model was developed as a form of science learning innovation that met the needs of the school, educators, and students. During the development phase, revisions were made to the e-module based on suggestions and input from expert validators. During the implementation phase, feedback from educators and students regarding the practicality of the e-module used in learning was used to refine the product. This ensured that the resulting e-module was suitable for use in learning activities.

Presentation of Trial Data

The results of validation by material experts are presented in detail in Table 1. These results show the scores for content suitability and presentation suitability, assessed by two material validators.

Table 1. Results of Validation by Material Experts

No.	Assessment Aspects	Indikator	V1	V2	Rata-rata
1.	Content Suitability	Material Alignment with Core Competencies	3,5	4,0	3,8
		Material Accuracy	4,0	4,0	4,0
		Material Up-to-Date	2,5	3,5	3,0
		Stimulating Student Curiosity	3,5	3,5	3,5
2.	Presentation Suitability	Presentation Techniques	4,0	4,0	4,0
Total Score			**17,5**	**19,0**	**18,3**
Average Score			**3,5**	**3,8**	**3,7**
Percentage (%)			**87,5%**	**95%**	**91,5%**

The validation results by media experts are shown in Table 2, which display aspects of media eligibility including convenience, size, and attractiveness.

Table 2. Media Expert Validation Results

No.	Assessment Aspects	Indicator	V1	V2	Average
1.	Media Eligibility	Convenience and Simplicity	3,7	3,7	3,7
		Size	4,0	4,0	4,0
		Attractiveness	4,0	3,5	3,8
Total Score			**11,7**	**11,2**	**11,5**

Average Score	**3,9**	**3,7**	**3,8**
Percentage (%)	**97,5%**	**93%**	**95,8%**

The results of validation by linguists are summarized in Table 3, focusing on language accuracy, appropriateness for the student's level, and conformity with Indonesian language rules.

Table 3. Results of Validation by Linguists

No.	Assessment Aspects	Indicator	V1	V2	Average
1.	Language Eligibility	Accuracy of Language Use	4,0	4,0	4,0
		Suitability to the Student's Developmental Level	4,0	4,0	4,0
		Suitability to Indonesian Language Rules	4,0	4,0	4,0
		Total Score	**12,0**	**12,0**	**12,0**
		Average Score	**4,0**	**4,0**	**4,0**
		Percentage (%)	**100%**	**100%**	**100%**

The results of the educator practicality test are presented in Table 4, showing how teachers assessed the e-module's effectiveness, clarity, and usability.

Table 4. Results of the Educator Practicality Test

No.	Statement	Score
1.	The e-learning module displays visually appealing	4
2.	The use of e-learning modules helps save time in the learning process	4
3.	The content of the e-learning modules is aligned with the learning material	4
4.	The content of the e-learning modules makes it easier for students to understand the concept of classifying living things	4
5.	The e-learning modules are aligned with learning objectives	4
6.	The use of e-learning modules can minimize conceptual misunderstandings among students	4
7.	The e-learning modules can help students identify learning problems	4
8.	The e-learning modules can help students find the correct answers independently	3
9.	The language used in the e-learning modules is clear, easy to understand, and appropriate to the students' level of understanding	3
10.	The linguistic elements (grammar, word choice, and punctuation) in the e-learning modules are used appropriately and consistently	4
	Total Score	**38**
	Average Score	**3,8**
	Percentage (%)	**95%**

The results of the student practicality test are displayed in Table 5, reflecting students' perceptions of the e-module's appearance, clarity, and ease of use.

Table 5. Results of Student Practicality Test

No.	Statement	Average Score (Σ 26 Students)
1.	I find the e-learning module's appearance attractive.	3,6
2.	I enjoy learning about the classification of living things using the e-learning module.	3,4

3.	Taking science lessons with the e-learning module was a new experience for me.	3,7
4.	The e-learning module helped me quickly understand the classification of living things.	3,7
5.	I find this e-learning module easy to use.	3,5
6.	The explanations in the e-learning module are clear and easy to understand.	3,7
7.	The e-learning module helped me identify learning problems.	3,6
8.	The e-learning module helped me find the correct answers.	3,6
9.	The language used in the e-learning module is easy to understand.	3,7
10.	The sentences and terms in the e-learning module are clear and unambiguous.	3,6
	Total Score	**36,1**
	Percentage (%)	**90,2%**

Discussion

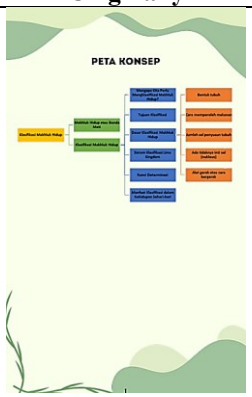
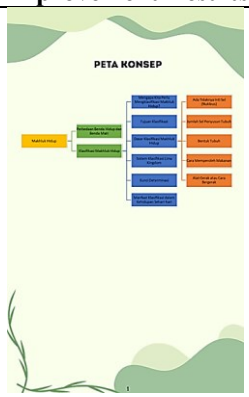
E-module validation is one of the benchmarks for determining the feasibility of a developed product (Andrianto & Fransisca, 2024). Product validation was conducted by six expert validators: two material experts, two media experts, and two language experts. The assessment results for these three aspects showed an average percentage of excellent results: 91.5% for the material aspect, 95.8% for the media aspect, and 100% for the language aspect. Based on the validity criteria according to Fitriasari (2021), all of these scores fall into the "very valid" category, thus the developed e-module meets the feasibility criteria for implementation in learning activities. A similar study reported that “the e-module achieved a validation score of 0.88 (very valid category), teacher response of 92.86 (very practical category), and student response of 90.74 (very practical category),” confirming that validated e-modules are considered valid and practical for science learning contexts (Yohana, Fakhruddin & Nasir, 2025).

This e-module meets the principles of teaching materials according to Azizah & Rachmadiarti (2023), namely that teaching materials can be considered good if they contain images, videos, text, and animations that can visualize concepts for students. This e-module is supported by validated content, diverse interactive features, and includes learning videos, animations, images, and comprehension tests that can be accessed through various devices by integrating the OIDDE learning model. Therefore, this e-module is expected to be a useful digital teaching material in educational institutions and an alternative to improve student understanding (Zahara, 2024). In line with this, research in JES found that an interactive e-module “contains written texts, images, animations, videos and games to capture students’ interest during the learning process” and was feasible for implementation in learning. The product's practicality test involved one seventh-grade science teacher and 26 seventh-grade students from Muhammadiyah 08 Junior High School, Batu City, as research subjects. After the e-module was implemented in learning activities, both teachers and students were asked to provide assessments of the e-module. The results of the practicality test showed a 95% teacher-to-teacher ratio and a 90.2% student-to-student ratio. Based on the practicality criteria according to Fitriasari (2021), all of these scores fall into the "very practical" category, indicating that the developed e-module not only meets the feasibility of materials, media, and

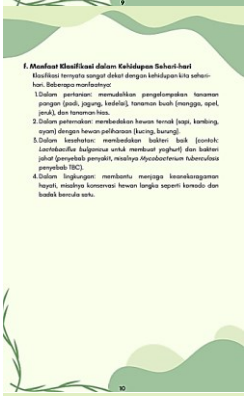
language, but also meets the learning needs of students who are more responsive to technological developments that can support the achievement of student learning mastery (Arova et al., 2024). During learning activities using the e-module based on the OIDDE learning model, students appeared more active, following each stage of the OIDDE learning model. Another JES article confirms that e-modules validated by experts and evaluated by teachers and students show high practicality and feasibility for use in classroom learning.

The high product validation results and positive responses from both educators and students indicate that the developed e-module based on the OIDDE learning model for the classification of living things for grade VII is highly suitable for use in learning activities because it can help students understand the concepts taught (Adrianus et al., 2023). Supporting this, JES research highlights that validated science e-modules can be implemented successfully in instructional settings, reinforcing their educational value. The use of e-modules in delivering material can encourage students to discover the concepts and materials taught by educators independently (Cahyono & Ambarwati, 2025). Furthermore, the e-module is based on the OIDDE learning model, which not only focuses on cognitive aspects but also encourages the development of ethical attitudes in everyday life. In science learning, students must not only understand scientific concepts and processes but also be given the opportunity to actively participate in real-life applications (Awwalina & Indana, 2022). The use of technology in education is expected to support the realization of 21st-century learning (Nisa et al., 2023). Research from JES further indicates that developed e-modules "are feasible to be implemented in schools," supporting the use of multimedia e-modules to enhance learning engagement and understanding among students. The e-module product, validated by expert validators, will be revised based on comments and suggestions from expert validators on material, media, and language. Multiple comments and suggestions from expert validators will be represented in a single display to avoid duplication. The results of the product revision are shown in Table 6.

Table 6. Product Revision Results

No.	Originally	Improvement Suggestions	Improvement Results
1.		Improving the concept map	

No.	Originally	Improvement Suggestions	Improvement Results
2.		Illustrations should be better, not just images of humans, but also animals or plants	
3		Re-examining the classification objectives in point 4	
4.		Improving the order in the classification basis	
			

No.	Originally	Improvement Suggestions	Improvement Results
5.		Creating and improving the determination key	
6.		Improving the benefits of the classification	
7.		Video presentation should not be directly from the YouTube platform	
8.		Improving several editorial elements to make the e-module more communicative Improvement Suggestions	

No.	Originally	Improvement Suggestions	Improvement Results
			

The revised e-module was then packaged digitally via a flipbook heyzine for interactive viewing. The final product can be accessed via the QR code in Figure 1.

Figure 1. Learning E-Module QR code

4. Conclusion

The OIDDE model-based learning e-module product on the classification of living things for grade VII was revised based on suggestions and input from expert validators to improve the quality of the e-module in terms of material, media, and language. The revisions included refining the concept map to make it more systematic, improving illustrations by adding variations of animal and plant objects, re-checking the objectives and basis of classification to make it more coherent, refining the determination key and improving the benefits of classification, and adjusting the learning media by avoiding direct links to YouTube and improving sentence editing to make it more communicative. Based on the results of the validation and practicality test, the OIDDE learning model-based e-module was declared valid and practical, so that after going through the revision stage according to the expert validator's suggestions, this product is suitable for use as supporting teaching materials for science learning for grade VII.

References

Adrianus, A., Astuti, I., & Enawaty, E. (2023). Hasil Analisis Kebutuhan Pengembangan E-Modul Berbasis Android pada Pembelajaran IPA. *Edukatif : Jurnal Ilmu Pendidikan*, *5*(3), 1431–1440. https://doi.org/10.31004/edukatif.v5i3.4923

Andrianto, R. S., & Fransisca, Y. (2024). Pengembangan E-Modul Berbasis Android pada Penggunaan Perkakas Tangan untuk Meningkatkan Hasil Belajar Peserta Didik Kelas X TAV di SMKN 3 Surabaya. *Jupiter: Publikasi Ilmu Keteknikan Industri, Teknik Elektro dan Informatika*, *2*(3), 69–91. https://doi.org/10.61132/jupiter.v2i3.283

Ardelia, N., & Juanengsih, N. (2021). Implementasi Pembelajaran Abad 21 pada Mata Pelajaran Biologi di SMA Negeri Kota Tangerang Selatan. *Jurnal Inovasi Pembelajaran Biologi*, *2*(2), 1–11. https://journal.unesa.ac.id/index.php/jipb

Aripin, I., Sugandi, M. K., Mu'minah, I. H., & Mulyani, A. (2020). Pelatihan Pembelajaran Biologi Abad 21. *Bernas: Jurnal Pengabdian Kepada Masyarakat*, *1*(3), 150–158. https://doi.org/10.31949/jb.v1i3.311

Awwalina, N. M., & Indana, S. (2022). Pengembangan E-Modul Interaktif Berbasis Qr Code untuk Melatihkan Literasi Sains Peserta didik Kelas X SMA pada Materi Ekosistem. *Bioedu*, *11*(3), 712–721. https://ejournal.unesa.ac.id/index.php/bioedu

Azizah, H. P., Hafiza, N., & Ilhami, A. (2022). Pengembangan E-Modul IPA SMP Berbasis Socio Scientific Issues (SSI) : Systematic Review. *Jurnal Pendidikan Indonesia : Teori, Penelitian, dan Inovasi*, *2*(4), 221–228. https://doi.org/10.59818/jpi.v2i4.206

Azizah, N., & Alberida, H. (2021). Seperti Apa Permasalahan Pembelajaran Biologi pada Peserta didik SMA?. *Journal For Lesson and Learning Studies*, *4*(3), 388–395. https://ejournal.undiksha.ac.id/index.php/jlls

Azizah, Z., & Rachmadiarti, F. (2023). Kelayakan Teoretis E-Modul Berbasis Inkuiri Materi Perubahan Lingkungan untuk Melatihkan Keterampilan Berpikir Kritis Peserta didik Kelas X. *Bioedu*, *12*(03), 842–849.

Azizi, T., Ningsih, K., & Fajri, H. (2024). Pengembangan E-Modul Interaktif Berbasis Android Materi Klasifikasi Makhluk Hidup di Kelas VII. *Eduproxima: Jurnal Ilmiah Pendidikan IPA*, *6*(3), 996–1005. http://jurnal.stkippgritulungagung.ac.id/index.php/eduproxima

Basyori, S. I. (2025). Peranan Guru Sebagai Fasilitator Dalam Dunia Pendidikan Modern. *Journal Syntax Idea*, *7*(4), 559–564.

Cahyono, V. N. A., & Ambarwati, R. (2025). Pengembangan E-Book Interaktif Sebagai Sumber Belajar Submateri Animalia Invertebrata untuk Melatihkan Kemandirian Peserta didik SMA Kelas X. *Bioedu*, *14*(1), 001–015. https://ejournal.unesa.ac.id/index.php/bioedu

Faturrahman, M. A., & Ningsih, K. (2023). Studi Literatur: Penerapan Model Discovery Learning Terhadap Hasil Belajar Peserta Didik pada Materi Klasifikasi Makhluk Hidup. *Journal on Education*, *06*(01), 7262–7274.

Fitriasari, D. N. M. (2021). Pengembangan Lembar Kegiatan Peserta Didik-Elektronik (E-LKPD) Berbasis Guided Discovery untuk Melatihkan Keterampilan Proses Sains Terintegrasi pada Materi Fotosintesis Kelas XII SMA. *Bioedu*, *10*(3), 510–522.

Fujiarti, A., Meilania, D. K., Angraeni, M., & Umah, R. N. (2024). Literatur Review : Pengaruh Penggunaan E-Modul Terhadap Hasil Belajar Siswa Sekolah Dasar. *Jurnal Jendela Pendidikan*, *4*(01), 83–89.

Hudha, A. M., Amin, M., Bambang, S., & Akbar, S. (2016). Telaah Model-Model Pembelajaran dan Sintaksnya Sebagai Upaya Pengembangan Model

Pembelajaran "OIDDE." *Jurnal Pendidikan Biologi Indonesia*, *2*(2), 109–124.

Hudha, A. M., Amin, M., Sumitro, S. B., & Akbar, S. (2018). The Effectiveness of OIDDE Learning Model in the Improvement of Bioethics Knowledge, Ethical Decision, and Ethical Attitude of Biology Pre-Service Teachers. *Journal of Baltic Science Education*, *17*(6), 960–971.

Hudha, A. M. (2020). *Model Pembelajaran OIDDE (Implementasinya Meningkatkan Pengetahuan Bioetika)*. Malang: Kota Tua.

Hudha, A. M., Sukarsono, S., & Handayani, N. R. (2021). Penerapan Model Pembelajaran OIDDE untuk Meningkatkan Keterampilan Pembelajaran Berbasis Karakter pada Guru Pendidikan Dasar dan Menengah. *Jurnal Inovasi Hasil Pengabdian Masyarakat (Jipemas)*, *4*(2), 269–281. https://doi.org/10.33474/jipemas.v4i2.9330

Hudha, A. M., Oktapiani, H., & Rahardjanto, A. (2024). Evaluating the Impact of the OIDDE Learning Model on Critical Thinking, Learning Outcomes, Ethical Attitudes, and Learning Engagement Among Indonesian High School Students. *Asia-Pacific Science Education*, *10*(2), 442–470. https://doi.org/10.1163/23641177-bja10087

Judijanto, L., Muhammadiah, M., Utami, R. N., Suhirman, L., Laka, L., Boari, Y., Lembang, S. T., Wattimena, F. Y., Astriawati, N., Laksono, R. D., & Yunus, M. (2024). *Metodologi Research and Development (Teori dan Penerapan Metodologi RnD)*. Jambi: PT. Sonpedia Publishing Indonesia. https://www.researchgate.net/publication/381290945

Hasibuan, S.H., Zulfarina, & Putra, R.A. (2023). Development of interactive e-modules based on Kvisoft Flipbook with discovery learning models on arthropod material to improve student learning outcomes. *Journal of Educational Sciences,* *7*(3), 452–464. https://jes.ejournal.unri.ac.id/index.php/JES/article/download/304/200

Kaniyah, Y., Purnamasari, I., & Peserta didiknto, J. (2022). Pengembangan E-Modul Pembelajaran IPA Berbasis Problem Based Learning untuk Meningkatkan Kemampuan Literasi Sains Peserta Didik. *Jurnal Kualita Pendidikan*, *3*(2), 2774–2156.

Kementerian Pendidikan Dasar dan Menengah Republik Indonesia. (2025). *Keputusan Kepala Badan Standar, Kurikulum, dan Asesmen Pendidikan Nomor 046/H/Kr/2025 Tentang Capaian Pembelajaran pada Pendidikan Anak Usia Dini, Jenjang Pendidikan Dasar, dan Jenjang Pendidikan Menengah*. Jakarta: Kementerian Pendidikan Dasar dan Menengah Republik Indonesia.

Kurniawan, R. A., & Hasanah, R. (2022). Pengembangan Game Quarted Card pada Materi Klasifikasi Makhluk Hidup Kelas VII SMP/MTS. *Bioeduca: Journal Of Biology Education*, *4*(2), 113–125. http://journal.walisongo.ac.id/index.php/bioeduca

Lesmana, A., Qadar, R., & Syam, M. (2020). Pengaruh Model Pembelajaran OIDDE Terhadap Kemampuan Berpikir Kritis Siswa di SMAN 2 Berau Pada Materi Suhu Dan Kalor. *Jlpf*, *1*(1), 11–18.

Lestari, C. A. A., Lestari, A. D., Magfirah, I., & Susilawati, S. (2025). Peran Bahan Ajar, Media dan Sumber Belajar: Kunci Sukses dalam Pembelajaran

Pendidikan Agama Islam. *At-Thullab : Jurnal Mahapeserta didik Studi Islam*, *7*(1), 1–21. https://doi.org/10.20885/tullab.vol7.iss1.art1

Ma'rifatillah, I., Efendi, R., & Hasanah, L. (2019). Effectiveness of OIDDE Learning Model with Reading Infusion Strategy in Trained 21st Century Students' Skills on Momentum and Impulse Materials. *Journal of Physics: Conference Series*, *1280*(5), 1–7. https://doi.org/10.1088/1742-6596/1280/5/052014

Mustaqimah, N., Dama, L., Usman, N. F., Akbar, Muh. N., & Nurrijal, N. (2023). Pengembangan Media Flashcard dengan Panduan Belajar Sambil Bermain Menggunakan Microsite untuk Pembelajaran Biologi Materi Klasifikasi Makhluk Hidup. *Khazanah Pendidikan*, *17*(1), 376. https://doi.org/10.30595/jkp.v17i1.17159

Mutmainnah, M., Aunurrahman, A., & Warneri, W. (2021). Efektivitas Penggunaan E-Modul Terhadap Hasil Belajar Kognitif pada Materi Sistem Pencernaan Manusia di Madrasah Tsanawiyah. *Jurnal Basicedu*, *5*(3), 1625–1631. https://doi.org/10.31004/basicedu.v5i3.952

Nabila, S., Adha, I., & Febriandi, R. (2021). Pengembangan Media Pembelajaran Pop Up Book Berbasis Kearifan Lokal pada Pembelajaran Tematik di Sekolah Dasar. *Jurnal Basicedu*, *5*(5), 3928–3939. https://doi.org/10.31004/basicedu.v5i5.1475

Nisa, K., Amanda, N., & Pribadi, R. A. (2023). Kolaborasi Pendidik dan Peserta Didik dalam Mewujudkan Digitalisasi dan Penguasaan Teknologi pada Pembelajaran Abad 21. *Jurnal Basicedu*, *7*(3), 1433–1445. https://doi.org/10.31004/basicedu.v7i3.5383

Nurjayanti, D., & Mustaji, M. (2021). Pengembangan E-Modul Materi Klasifikasi Makhluk Hidup pada Mata Pelajaran Ilmu Pengetahuan Alam Kelas VII di SMP PGRI Tumbrasanom. *Jurnal Mahasiswa Teknologi Pendidikan*, *11*(5), 1–10.

Paat, M., Margo Tumbel, F., & Bery Mokalu, Y. (2022). Pengembangan Media Pembelajaran Bentuk Lagu dengan Menggunakan Model PBL pada Materi Klasifikasi Makhluk Hidup di SMA Negeri 1 Motoling. *Soscied*, *5*(2), 287–295.

Permatasari, I., Ahmad, J., Uno, W. D., Latjompoh, M., & Mardin, H. (2025). Pengembangan Media Pembelajaran Berbasis Video Animasi pada Materi Klasifikasi Makhluk Hidup Kelas X di SMA Negeri 1 Suwawa. *Jupeis: Jurnal Pendidikan Dan Ilmu Sains*, *4*(1), 16–29. https://jurnal.jomparnd.com/index.php/jp

Putri, L. D., & Erita, Y. (2023). Pengembangan E-Modul Menggunakan Canva pada Pembelajaran IPAS di Kelas IV Sekolah Dasar. *Innovative: Journal of Science Research*, *3*(2), 7175–7185.

Rosiana, Y., Syafii, W., Putra, R.A., & Futra, D. (2023). Effectiveness of e-module circulation system based on 8E learning cycle on high school student's critical thinking ability. *Journal of Educational Sciences, 7*(3), 434–441. https://jes.ejournal.unri.ac.id/index.php/JES/article/download/302/198/689

Sari, F. F. K., & Atmojo, I. R. W. (2021). Analisis Kebutuhan Bahan Ajar Digital Berbasis Flipbook untuk Memberdayakan Keterampilan Abad 21 Peserta Didik pada Pembelajaran IPA Sekolah Dasar. *Jurnal Basicedu*, *5*(6), 6079–6085. https://doi.org/10.31004/basicedu.v5i6.1715

Sartina, S., Jamilah, J., Suarga, S., & Damayanti, E. (2022). Model Pembelajaran OIDDE pada Keterampilan Metakognitif dan Hasil Belajar Kognitif Siswa MAN 1 Bulukumba. *Bioedusiana: Jurnal Pendidikan Biologi*, *7*(1), 173–183. https://doi.org/10.37058/bioed.v7i1.3271

Sasmita, N. N. N., Mahrus, M., Lestari, T. A., & Bahri, S. (2023). Pemanfaatan Lingkungan Sekolah Sebagai Sumber Belajar pada Materi Klasifikasi Makhluk Hidup untuk Meningkatkan Hasil Belajar Siswa. *Journal Of Classroom Action Research*, *5*(2), 59–64. https://doi.org/10.29303/jcar.v5i2.3023

Suryani, E., & Kusmiyati, K. (2025). Analisis Faktor yang Mempengaruhi Kurangnya Keaktifan Ssiwa dalam Pembelajaran Biologi di Kelas X B MA Plus Nurul Islam Sekarbela. *Jurnal Ilmiah Profesi Pendidikan*, *10*(1), 666–671. https://doi.org/10.29303/jipp.v10i1.3165

Wahyuni, R., L.N., F., Putra, R.A., Linggasari, M.N., Wulandari, P.A., & Fadilah, M. (2025). Project-based learning (PjBL) green pedagogy e-module in improving creative thinking and digital literacy. *Journal of Educational Sciences,* *9*(2), 876–885. https://jes.ejournal.unri.ac.id/index.php/JES/article/download/40/36/81

Widiastuti, N. L. G. K. (2021). E-Modul dengan Pendekatan Kontekstual pada Mata Pelajaran IPA. *Jurnal Imiah Pendidikan dan Pembelajaran*, *5*(3), 435–445. https://doi.org/10.23887/jipp.v5i3.37974

Yohana, V., Fakhruddin, Z., & Nasir, M. (2025). Development of science e-modules based on ethnoscience work, energy, and simple machine junior high school. *Journal of Educational Sciences, 9*(6), 5718–5731. https://jes.ejournal.unri.ac.id/index.php/JES/article/download/222/670

Yusma, M., Sinaga, M., & Rahman, E. (2025). Analysis of the needs of junior high school students for e-modules assisted by Flipbook on pantun writing material. *Journal of Educational Sciences,* *9*(2), 538–546. https://jes.ejournal.unri.ac.id/index.php/JES/article/download/9/6

How to cite this article:

Azizah, H. F., Hudha, A . M., & Permana, F. H. (2026). Development of A Learning E-Module Based on The OIDDE Learning Model on The Material on The Classification of Living Things in Class VII of Muhammadiyah 08 Junior High School, Kota Baru. *Journal of Educational Sciences*, *10(2)*, 3450-3466.