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The Development of Discovery Learning-Based E-Module for Teaching Analytical Exposition Text Reading in Senior High School

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Abstract

Many senior high school students still face difficulties in learning analytical exposition texts, particularly in understanding the generic structure, language features, and access to engaging instructional materials. In response to these challenges, this study develops a discovery learning-based e-module to support reading instruction, evaluate the feasibility and examines students' responses of the developed product. A Research and Development (R&D) approach following the ADDIE framework (Analysis, Design, Development, Implementation, and Evaluation) was adopted from Branch (2009). The development process included a needs analysis involving three students to inform the e-module design, expert validation conducted by four validators representing media, material, language, and practitioner expertise, followed by a limited trial with 15 students and a large-scale trial involving 30 students of senior high school at MAN 1 Cimahi. Expert validation indicated that the developed e-module met the criteria of valid to highly valid across the media, material, language, and practitioner aspects. Furthermore, students' responses in both the limited and large-scale trials were categorized as excellent, indicating positive acceptance of the developed e-module. Overall, the findings suggest that the developed e-module is a valid and well-received instructional resource that can be used to support the teaching of analytical exposition texts reading in senior high schools.

Keywords: E-Module; Analytical Exposition Text; Discovery Learning; Teaching Reading

INTRODUCTION

Reading plays a central role in the learning process, and serves as the foundation for language proficiency and communication. According to Grabe & Stoller (2013), successful reading extends beyond recognizing written symbols. It requires readers to interpret ideas and construct meaning from written texts. Reading is also described as a fundamental and essential language skill for academic success (Mulatu & Regassa, 2022; Nabella & Rini, 2023). Students' reading skills are developed starting with learning to read word by word, and then progressing to understanding the meaning of words, sentences, and eventually entire texts. Within the Indonesian EFL curriculum, senior high school students are required to comprehend several genres of academic texts, one of which is analytical exposition, as part of developing language proficiency through real-world social and communicative contexts (Febriyanto et al., 2025). Students must use higher-order thinking abilities including critical analysis and reasoning to identify the thesis statement, find logical supporting arguments, and form structured reiteration in analytical exposition texts (Liberta et al., 2024). Analytical exposition texts are still among the hardest for high school students to comprehend, despite their importance.

Based on a preliminary needs analysis conducted at MAN 1 Cimahi, several learning challenges were experienced by students when studying analytical exposition texts. First, students demonstrated difficulty in identifying the general structure of the text, particularly in distinguishing between the thesis, arguments, and reiteration. Instead of critically analyzing the text, students tended to focus only on superficially answering text comprehension questions. Second, students also struggled with the grammar commonly found in analytical exposition texts, which further hinders their overall reading comprehension. Third, limited access to adequate teaching materials was identified as a contributing factor. Students relied solely on textbooks during English class. This lack of resources often led to monotonous and text-based learning activities, which in turn reduced student engagement and motivation. Consequently, students faced persistent cognitive and linguistic difficulties in comprehending analytical exposition texts. This situation is consistent with research by Nurhaliza et al. (2024), who found that limited learning resources are a major barrier for students in understanding English language instruction.

Innovation in the creation of educational materials is spreading more widely as technology develops. To raise the standard of education, innovation in teaching and learning is essential (Arifin & Ramadhan, 2025). Students can rely not only on printed instructional materials but also on digital ones. The availability of digital instructional materials allows students to learn anytime and anywhere without always having to depend on the teacher in the classroom (Sahida & Jufinda, 2024). Moreover, the development of digital teaching materials offers more than just effectiveness and accessibility, it can be combined with multimedia components such as interactive audios, images, and videos in digital instructional materials. Interactive multimedia features, significantly enhance student motivation and academic achievement, as they successfully spark interest, active participation, and drive throughout the educational process (Nisa et al., 2024; Yonanda et al., 2024). One form of digital material that integrates these multimedia components is an e-module, which will be developed in this study.

Electronic module (e-module) is electronic teaching material systematically developed based on the curriculum and organized into structured learning units that enable students to learn independently. Delivered through digital devices such as computers and smartphones, e-modules integrate interactive multimedia elements to provide flexible learning experiences tailored to students' learning needs (Arifin & Ramadhan, 2025; Maghfiroh et al., 2024). These characteristics have the potential to promote students' independent learning and engagement by providing flexible access to structured learning materials integrated with multimedia features and interactive activities (Alyusfitri et al., 2024; Rahmawati et al., 2025).

To enhance the effectiveness of an e-module, it is important to implement learning strategies that encourage students' independent learning. One appropriate approach for teaching reading, particularly analytical exposition texts, is discovery learning. Bruner (1961, 1966) describes Discovery Learning as a cognitive learning approach in which students construct their own understanding by organizing information and identifying concepts, rather than receiving ready-made knowledge from the teacher. This approach places students at the center of the learning process by encouraging them to investigate, explore, and develop knowledge both individually and collaboratively. The implementation of discovery learning follows six sequential activities: stimulation, problem statement, data collection, data processing, verification, and generalization (Kemendikbud, 2016). Similarly, Liberta et al. (2024) argue that discovery learning effectively supports reading comprehension because students are guided to discover information and construct meaning independently. These characteristics indicate that discovery

learning is well-suited for incorporation into the design of e-module for teaching reading analytical exposition texts.

Previous studies have explored discovery learning and digital instructional materials from different perspectives. Astuti et al. (2023) developed discovery learning-based worksheets to support writing instruction, while Liberta et al. (2024) investigated the effect of discovery learning on students' reading comprehension of analytical exposition texts without developing digital instructional materials. Similarly, Arifin & Ramadhan (2025) developed a discovery learning-based e-module to improve writing skills, whereas Simanjuntak & Purwanti (2025) developed interactive Liveworksheets for teaching analytical exposition text reading. Although these studies demonstrate the potential of discovery learning and digital instructional media, they differ in instructional products, research purposes, and learning contexts. Therefore, further research is needed to develop and validate a discovery learning-based e-module specifically designed for teaching analytical exposition text reading and to examine students' responses toward its implementation in the context of Indonesian senior high schools.

In response to the identified research gaps, this study developed a discovery learning-based e-module to support teaching analytical exposition text reading at the senior high school level. The development process adopted the ADDIE model, which consists of five phases: Analysis, Design, Development, Implementation, and Evaluation. According to Branch (2009), ADDIE provides a systematic instructional design framework for developing and evaluating effective instructional materials. The model has been widely implemented in educational research because of its straightforward, flexible, and adaptable procedures across various instructional context (Rahayu, 2025; Nita et al., 2022). By following these structured stages, the e-module was designed, validated, revised, and field-tested to ensure its validity and practicality as instructional material for analytical exposition texts reading.

Based on this background, this study was formulated around two research questions: (1) What is the feasibility of developing a discovery learning-based e-module for teaching analytical exposition texts reading in senior high school? (2) How do students respond to the use of the discovery learning-based e-module in learning analytical exposition texts reading? The results of this study are expected to offer practical insights for EFL instructional material developers, curriculum designers, and English teachers by providing a potentially useful digital learning resource that can support the teaching of analytical exposition text reading in senior high schools.

METHOD

This research employed a Research and Development (R&D) design by using the ADDIE instructional design model, which comprises five sequential phases: Analysis, Design, Development, Implementation, and Evaluation (Branch, 2009). The model was selected to guide the systematic development and evaluation of a discovery learning-based e-module designed to support the teaching analytical exposition text reading at the senior high school level. The development procedure commenced with a needs analysis to identify students' learning requirements and concluded with an evaluation of the e-module's feasibility through expert validation and field-testing activities.

The research was conducted at MAN 1 Cimahi, West Java, Indonesia, involving different groups of participants across the ADDIE development phases. During the analysis phase, three eleventh-grade students were purposively selected based on recommendations from their

English teacher to represent high, medium, and low levels of English proficiency. The inclusion of students with different proficiency levels was intended to obtain diverse perspectives on students' learning difficulties and instructional needs, consistent with the purposive sampling approach described by Zhou & Rose (2025). The findings from these interviews served as the basis for designing the e-module. During the development phase, the prototype was evaluated by four validators consisting of an Educational IT lecturer as the media expert, an English Education lecturer with expertise in English language teaching as the material expert, an English lecturer specializing in language and linguistics as the language expert, and an English teacher from MAN 1 Cimahi serving as the practitioner. Following revisions based on the validators' feedback, the e-module was implemented through two stages of field testing. The limited trial involved fifteen eleventh-grade students, while the large-scale trial involved thirty students from the same grade level.

Three research instruments were utilized to collect data throughout this study. First, the interview protocol consisted of seven semi-structured questions adapted from Cyrena (2023), who developed an English e-module on tenses. The original interview protocol was modified as needed to identify students' learning difficulties, and instructional needs related to analytical exposition texts. Second, the validation sheets were adapted from Fitriya (2024), who developed an Indonesian language e-module. The validation instruments were modified to suit the developed e-module while maintaining the original constructs and evaluation criteria. The instrument evaluated four aspects: media (8 items), material (10 items), language (12 items), and practicality (11 items). All validation sheets employed a five-point Likert scale ranging from 1 (Totally Invalid) to 5 (Highly Valid). Third, a ten-item student response questionnaire was adapted from Ramadanti et al. (2021) who developed a problem-based learning (PBL) mathematics e-module. The questionnaire was contextualized for this study while retaining the original constructs. It was administered after the field trial to evaluate the design, content, and linguistics aspecs of the developed e-module. The questionnaire employed a five-point Likert scale ranging from 1 (Very Poor) to 5 (Excellent).

The development procedure was carried out by following the five phases of the ADDIE model. During the analysis phase, semi-structured interviews were conducted with three selected students to identify their learning difficulties and instructional needs. The findings from this phase served as the basis for designing the e-module. In the design phase, the learning objectives, module organization, learning activities, assessments, interface, and multimedia components were designed based on principles of discovery learning. During the development phase, the e-module was produced and subsequently validated by four experts. The product was then revised based on the validators' suggestions to improve its quality and feasibility. During the implementation phase, the revised e-module was administered through two stages of field testing, namely a limited trial involving fifteen students and a large-scale trial involving thirty students. Finally, during the evaluation phase, the findings obtained from the needs analysis, expert validation, and field implementation were synthesized to assess the overall quality of the developed e-module and to identify aspects requiring final refinement before the product was finalized.

Both qualitative and quantitative data were analyzed in this study. The qualitative data obtained from the semi-structured interviews were examined using the Miles and Huberman analysis model, which includes four stages: data collection, data reduction, data display, and conclusion drawing (Aisyah, 2024). This analysis aimed to identify students' learning needs and served as the basis for developing the e-module. Meanwhile, quantitative data obtained from the expert

validation sheets and student response questionnaires were analyzed using descriptive statistics by calculating the mean and percentage scores. The expert validation results were calculated using the mean formula and validity criteria proposed by Fitriya (2024):

$$Mean = \frac{Total\ Score}{Number\ of\ Indicator}$$

Table 1. Validation Score Interpretation

Interval	Category
4,22-5,00	Highly Valid
3,41-4,21	Valid
2,61-3,40	Fair
1,80-2,60	Invalid
0-1,79	Totally Invalid

Whereas the results of the student response questionnaire were then calculated using percentage scores, according to the following formula and the percentage criteria adapted from Ramadanti et al. (2021) :

$$Percentage = \frac{Total\ Score}{Maximum\ Score} \times 100\%$$

Table 2. Students' Response Score Interpretation

Interval	Category
81% – 100%	Excellent
61% – 80%	Good
41% – 60%	Fair
21% – 40%	Poor
0% – 20%	Very Poor

RESULTS AND DISCUSSION

Results

The results are organized according to the five phases of the ADDIE framework: analysis, design, development, implementation, and evaluation.

The Process Developing Discovery Learning-based E-Module for Teaching Analytical Exposition Texts Reading

a) Analysis

The analysis phase began with a needs analysis involving semi-structured interviews with three eleventh-grade students who had previously learned analytical exposition texts. Based on the interviews, it was found that they experienced difficulties understanding the social function, generic structure, and language features of the texts.

Although they understood the lesson during classroom instruction, they often struggled to retain the material, particularly grammar concepts.

> *Student 1: "All I remember is the topic of the text; as for the material of the text itself, I don't remember it—especially the grammar sections."*

Further interviews indicated that these difficulties were also influenced by the limited availability of learning resources for independent study.

> *Student 3: "I understand the lesson when I'm in class, but after a few days I forget what I just learned, because I don't have any materials to review at home."*
> *Student 2: "During class, we are provided with textbook only during English class."*

These findings suggest that students have limited opportunities to review the material independently, which may hinder their long-term understanding.

In addition, students expressed a preference for interactive digital learning media that present relevant examples, multimedia elements, and gamified activities to make learning more engaging.

> *Student 3: "I prefer learning through materials that include pictures, videos, and exercises or games, so that learning isn't boring and is easier to understand."*

Overall, the findings indicated a need to develop an interactive and easily accessible discovery learning-based e-module that could facilitate independent learning.

b) Design

Following the needs analysis, the study proceeded to the design phase, this phase the researchers developed the initial design and content of the e-module by integrating the six sequential stages of the discovery learning approach: stimulation, problem statement, data collection, data processing, verification, and generalization. The initial design and content were aligned with the curriculum, syllabus, and students' learning objectives. The e-module included a cover page, acknowledgement, usage instructions, learning objectives, table of contents, learning materials, exercises, summary, assessments, glossary, and references. The topics were also selected by aligning the content of the textbook used—which focus on healthy life—with mental health issues that are currently popular among students. This design process ensured visual appeal, incorporated multimedia features using hyperlinks, and interactive learning activities needed to help independent learning.



Figure 1. Initial Design of E-Module

Figure 1 provided the initial design of the e-module, which incorporated the six stages of the discovery learning model. The learning process began with the stimulation stage, where students were presented with trigger questions related to anxiety to arouse their curiosity and activate their prior knowledge. In the problem statement stage, students were encouraged to identify and formulate issues concerning the importance of maintaining mental health. During the data collection stage, students independently explored various sources to gather facts, evidence, and supporting arguments relevant to the issue. Rather than receiving explicit instruction on analytical exposition texts at the outset, they constructed their initial understanding by selecting information that they considered appropriate to support their viewpoints. In the data processing stage, students organized the collected information into an analytical exposition text based on their own understanding. Subsequently, in the verification stage, students compared and refined their work by examining the explanations provided in the e-module on analytical exposition texts. Finally, in the generalization stage, students synthesized their findings and formulated conclusions about the defining characteristics of analytical exposition texts, thereby constructing a more accurate conceptual understanding.

c) Development

The third phase was development. The researchers constructed the entire e-module in accordance with the design established in the previous phase. Once the initial draft of the e-module was completed, it was validated by four validators: a media expert, a material expert, a language expert, and a practitioner. The results were described in detail in the first research question section.

d) Implementation

In the implementation phase, the developed e-module was implemented in classroom learning after completing the validation and revision stages based on the validators' suggestions. The primary purpose of this phase was to pilot the use of the e-module during classroom instruction. The implementation was conducted through two stages: a limited trial involving fifteen eleventh-grade students and a large-scale trial involving thirty students from the same grade level. During both trials, students used the e-module throughout the learning activities and subsequently completed a ten-item response questionnaire covering three aspects: design, content, and language. The collected responses provided feedback regarding students' experiences in using the e-module and served as input for the final evaluation of the developed product. The results were described in detail in the second research question.

e) Evaluation

The evaluation phase was the final phase in the development process of the e-module. Evaluations were conducted based on feedback from expert validators in media, material, and language, as well as a practitioner, during the development phase. In addition, an analysis was conducted on the results of the limited and large-scale trials, as well as the students feedback while using the e-module; the e-module was then revised and readjusted based on this feedback to meet students' needs.

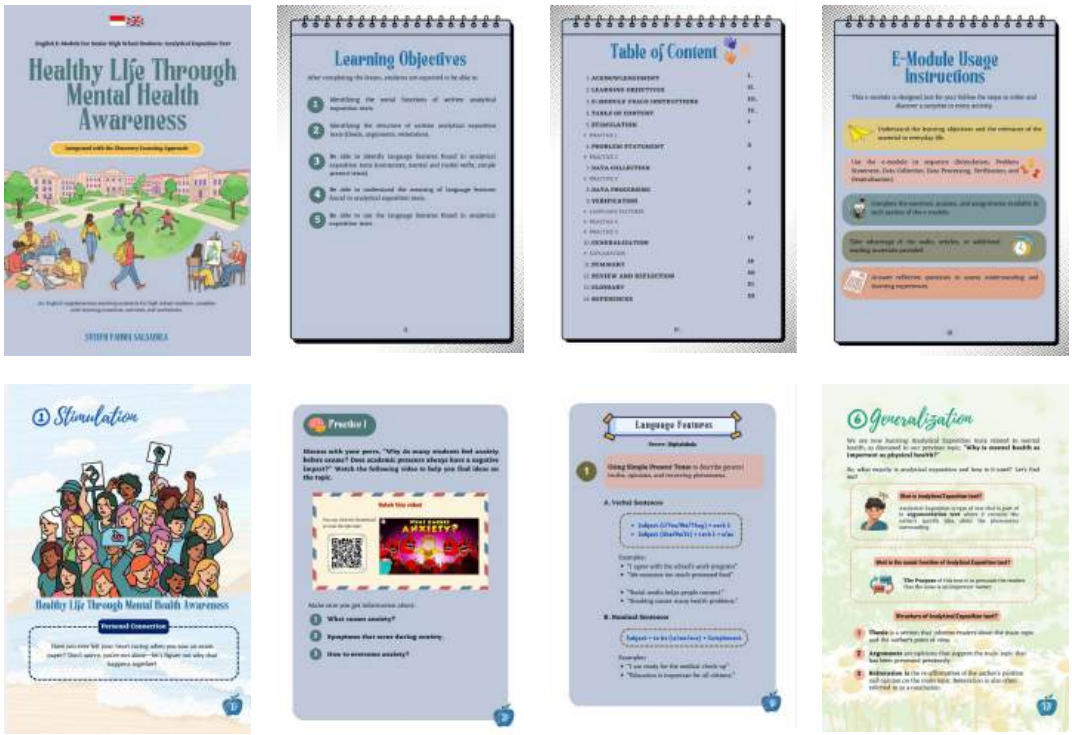

Figure 2. Final Version of E-Module
https://bit.ly/E-Module_Final

Figure 2 showed the final version of the e-module after it was revised. This process ensured that the final instructional materials were aligned with curriculum requirements

and student abilities. The final version of the developed e-module is available online for educational purposes and can be accessed via the link provided.

The Feasibility of Developing Discovery Learning-based E-Module for Teaching Analytical Exposition Texts Reading

The feasiblility of the e-module for the current study was determined based on the validation results from four validators: media, content, language, and practitioners. The validation results are presented in the following tables:

Table 3. Media Validation Result

No	Indicators	Points
1	The presentation of the e-module sparks students' interest	5
2	The images in the e-module are crisp and clear	4
3	The color scheme in the e-module is harmonious and appropriate for students' needs	2
4	The text in the e-module is clear and easy for students to read	4
5	The e-module is easy for students to use and understand	4
6	The media (images/videos/audio) in the e-module are clear and relevant	4
7	The e-module is properly organized according to its layout (title, subtitle, pages, etc.)	5
8	The layout of objects in the e-module is detailed	5
	Total	**33**
	Mean	**4,1**
	Category	**Valid**

Based on the media validation results in Table 3, The media validation obtained a mean score of 4,1 categorized as Valid. Among 8 items, 7 items scored 4-5, while 1 item on color scheme scored 2, indicating that the harmony and appropriateness of the colors need to be revised to improve visual comfort and readability.

Table 4. Material Validation Result

No	Indicators	Points
1	Alignment of the presented material with the Learning Outcomes	4
2	Alignment of the presented material with the Learning Objectives	3
3	Alignment of the material with the merdeka curriculum	4
4	The material in the e-module is easy for students to use	4
5	The material in the e-module is up-to-date	4
6	The content in the e-module fosters students' character	4
7	The content in the e-module is aligned with students' cognitive development	4
8	The sequence of the content and the stages of delivery align with students' ways of thinking	4
9	The content in the e-module encourages students to seek out more information	5

10	The content in the e-module is easier for students to understand	4
	Total	**40**
	Mean	**4**
	Category	**Valid**

As shown in Table 4, the content proved to be engaging and capable of sparking students' curiosity. Furthermore, the material demonstrated strong alignment with the Merdeka Curriculum, students' cognitive development, and logical reasoning.

Table 5. Language Validation Result

No	Indicators	Points
1	Accuracy of sentence structure	4
2	Effectiveness of sentences	5
3	Standard use of terminology	5
4	Comprehension of the message or information	4
5	The language's ability to motivate students to engage	3
6	The language's ability to encourage students to think critically	4
7	Appropriateness of language for learners' intellectual development level	3
8	Grammatical accuracy	4
9	Spelling accuracy	5
10	Consistency in terminology use	5
11	Consistency in symbol use	5
12	Consistency in icon use	5
	Total	**52**
	Mean	**4,3**
	Category	**Highly Valid**

The language validation results in Table 5 showed positive results. There is still room for minor improvements regarding the language' ability to motivate and encourage students to engage in learning.

Table 6. Practitioner Validation Result

No	Indicators	Points
1	The e-module has clear instructions for use	5
2	The e-module is well-organized and presented	5
3	The e-module is clean and well-proportioned	5
4	The e-module is able to spark students' interest in learning	4
5	The e-module is tailored to students' characteristics	4
6	The e-module aligns with the topic being taught	5
7	The e-module is easy for students to use	4
8	The e-module is easy to carry anywhere	5
9	The e-module can be used repeatedly	5
10	The e-module is of good quality	5
11	The e-module is easy to carry and store	5
	Total	**52**

Mean	**4,7**
Category	**Highly Valid**

The practitioner validation results in Table 6 also showed positive results. All practical aspects were met; however, the validator noted that the learning objective should explicitly state that students were expected to identify the social function of the text.

The Students' Responses toward the Use of Discovery Learning-Based E-Module in Learning Reading of Analytical Exposition Texts

Student response on the usefulness of the e-module was evaluated through limited and large-scale trials using a questionnaire that covered the following aspects: design, content, and language during the implementation phase. A summary of the results is presented in the following table:

Table 7. Results of the Limited Trial

Aspect	Question Item	Score	Max Score	Percentage	Category
Design	2	133	150	88,6%	Excellent
Content	5	320	375	85,3%	Excellent
Linguistics	3	197	225	87,5%	Excellent
Total	**10**	**650**	**750**	**86,6%**	**Excellent**

The limited trial involved 15 eleventh-grade students and was conducted to obtain preliminary feedback on the use of the developed e-module before the large-scale trial. As presented in Table 7, the findings indicated that the students perceived the e-module as visually appealing, easy to understand, and well organized. They also reported the examples, illustrations, and instructional videos were considered helpful in supporting their understanding of analytical exposition texts. In addition to completing the response questionnaire, several students suggested improving the clarity of the navigation buttons and repairing broken hyperlinks to enhance the usability of the e-module. These suggestions were incorporated into the revised version before it was implemented in the large-scale trial.

Table 8. Results of the Large-Scale Trial

Aspect	Question Item	Score	Max Score	Percentage	Category
Design	2	268	300	89,3%	Excellent
Content	5	648	750	86,4%	Excellent
Linguistics	3	387	450	86%	Excellent
Total	**10**	**1303**	**1500**	**86,8%**	**Excellent**

After minor revisions based on the limited trial, the e-module was implemented in a large-scale trial involving 30 students. As shown in Table 8, the overall score increased to 86.8%, which also fell into the "excellent" category. These results indicated that the developed e-module consistently received positive feedback from students across all assessment aspects.

Discussion

This research aimed to develop a discovery learning-based e-module for teaching analytical exposition texts in senior high school by employing the ADDIE model as a systematic instructional design framework. The evaluation results showed that the developed e-module achieved mean scores of 4.1 for media, 4 for material, 4.3 for language, and 4.7 for practicality, indicating ratings ranging from valid to highly valid from expert validators. Furthermore, during both the limited-scale and large-scale field trials, the e-module consistently received positive response from students, with scores ranging from 86.6% to 86.8%, indicating the excellent category. These outcomes suggest that the e-module has potential for classroom use. The successful development process also confirms that the ADDIE model provides a systematic procedure for designing digital instructional materials that are aligned with curriculum objectives, learners' needs, and expert feedback, supporting the instructional design principles proposed by Branch (2009).

The needs analysis with three students indicated that they experienced difficulties recalling the social function, generic structure, and language features of analytical exposition texts. These findings may indicate that students had not yet developed a comprehensive understanding of the organizational and language characteristics of the text. Based on the interview results, many students relied primarily on classroom instruction and had limited opportunities to review the material independently after the lesson, which may have contributed to their difficulty in retaining the concepts. In addition, students reported limited access to learning resources and expressed a preference for interactive digital materials that incorporated multimedia and engaging activities. These findings are consistent with Nurhaliza et al. (2024), who reported that limited learning resources constitute a major obstacle to English language learning. Likewise, Sahida & Jufinda (2024) argued that digital teaching materials provide students with greater opportunities to access learning resources independently regardless of time and place. Therefore, providing accessible and interactive digital learning resources can help reinforce students' understanding of analytical exposition texts by enabling them to review key concepts beyond classroom instruction.

The implementation of discovery learning constituted the primary foundation of the developed e-module. Rather than presenting information directly, the module guided students through the six stages of discovery learning (stimulation, problem statement, data collection, data processing, verification, and generalization), allowing them to construct their own understanding of analytical exposition texts. This instructional process reflects Bruner's (1961, 1966) cognitive learning theory, which emphasizes that meaningful learning occurs when learners actively discover concepts through exploration and reasoning. The design of the present e-module aligns with Liberta et al. (2024), who reported that discovery learning improves students' comprehension of analytical exposition texts by encouraging them to examine textual evidence independently instead of passively receiving explanations from teachers.

The positive responses obtained from both the limited and large-scale trials may be associated with the characteristics of the developed e-module as a structured digital learning resource that integrates multimedia elements and supports independent learning. The developed e-module incorporated instructional materials, instructional videos, audio, images, and interactive learning activities that were systematically organized according to the discovery learning stages. These features addressed students' preferences identified during the needs analysis, particularly their need for engaging and accessible learning materials that could be used independently beyond classroom instruction. This interpretation is consistent with Nisa et al. (2024) and Yonanda et al. (2024), who reported that multimedia integration enhances students' motivation, engagement, and academic achievement by combining visual and textual information in meaningful ways. Likewise, the present findings align with Arifin & Ramadhan (2025), Maghfiroh et al. (2024), Alyusfitri et al. (2024) and Rahmawati et al. (2025), who suggested that e-modules facilitate independent learning by providing systematically organized learning materials integrated with interactive multimedia features.

Although the overall validation results were highly positive, several indicators received comparatively lower scores. The media expert suggested improvements to the color harmony of the interface because the colors used were too saturated, while language validators recommended that the instructional language be made more motivating and better aligned with the characteristics of high school-level language. These findings indicate that instructional quality is influenced not only by content accuracy but also by visual communication and learner-centred language. Consequently, future revisions should place greater emphasis on the visual design, motivational language, and contextual examples that better reflect students' daily experiences in order to further enhance the overall learning experience.

This study also contributes to the existing literature on discovery learning and digital instructional materials by integrating both approaches into the development of an e-module for teaching analytical exposition text reading. Previous studies have investigated these topics from different perspectives. Astuti et al. (2023) developed discovery learning-based worksheets to improve students' writing skills, whereas Liberta et al. (2024) examined the effectiveness of discovery learning in improving students' reading comprehension without developing a digital instructional product. Similarly, Arifin & Ramadhan (2025) developed a discovery learning-based e-module for writing instruction, while Simanjuntak & Purwanti (2025) designed interactive Liveworksheets for teaching analytical exposition text reading. Unlike these previous studies, the present research developed an interactive e-module integrating discovery learning principles specifically for analytical exposition reading and evaluated its feasibility through expert validation and students' responses. Therefore, this study complements previous studies by providing evidence regarding the development, validation, and students' acceptance of a discovery learning-based e-module for teaching analytical exposition text reading.

Nevertheless, this study still has several limitations. First, the needs analysis involved only three students representing different proficiency levels, so the identified learning needs may not fully represent the broader student population. Second, this study focused on product development,

expert validation, and students' responses of practicality, rather than on measuring learning effectiveness through experimental comparisons. Therefore, future studies should investigate the effectiveness of the developed e-module in improving students' reading comprehension of analytical exposition texts through experimental or quasi-experimental research designs.

CONCLUSION

This study developed a discovery learning-based e-module for teaching analytical exposition text reading using the ADDIE model. The development process was informed by a preliminary needs analysis involving three eleventh-grade students at MAN 1 Cimahi. The findings confirmed that the developed e-module achieved valid to highly valid criteria, received mean validation scores ranging from 4 to 4.7 out of 5 from media, material, language, and practitioner validators, indicating that it met the criteria for instructional quality and feasibility. Furthermore, students' responses obtained during the field trials showed a response rate of 86.6% in the limited trial and 86.8% in the large-scale trial, indicating that the e-module received positive feedback in terms of its design, content, and language. These findings indicate that the developed e-module is feasible as a digital instructional material for teaching analytical exposition text reading within the context of the present study. Nevertheless, because the needs analysis involved only three students and the implementation was conducted in a single senior high school using one instructional topic, the findings should be interpreted cautiously. Future studies are recommended to examine the effectiveness of the developed e-module in improving students' reading comprehension through experimental research involving larger and more diverse samples.

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