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Transforming English Language Learning Through Interactive Digital Modules: A Development Study in Indonesian Primary Education in SMA Muhammadiyah Rappang

Abd Kahar, La Baba,Usman M, Sitti Aisa, Sam Hermansyah, Suci Ramdani
[12345] Universitas Muhammadiyah Sidenreng Rappang
Email : abd.kahar@gmail.com

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Abstrak
Integrasi teknologi digital dalam pendidikan bahasa Inggris telah membuka peluang untuk mengembangkan sumber belajar interaktif yang mendukung keterlibatan siswa, aksesibilitas, dan pembelajaran mandiri. Penelitian ini mengusulkan pengembangan modul pembelajaran bahasa Inggris digital interaktif di SMA Muhammadiyah Rappang, Indonesia, menggunakan model desain pembelajaran ADDIE yang mencakup tahap Analisis, Desain, Pengembangan, Implementasi, dan Evaluasi. Rancangan penelitian ini diadaptasi dari penelitian terdahulu mengenai pengembangan modul bahasa Inggris digital pada jenjang sekolah dasar di Indonesia. Penelitian ini bertujuan untuk mengidentifikasi kebutuhan belajar siswa, merancang materi pembelajaran digital interaktif, serta mengevaluasi validitas dan kepraktisan modul yang dikembangkan. Pendekatan Penelitian dan Pengembangan (*Research and Development*/R&D) diusulkan dengan melibatkan analisis kebutuhan, perancangan materi pembelajaran, pengembangan modul digital, validasi ahli, dan implementasi di kelas. Modul ini dirancang untuk mengintegrasikan unsur multimedia, meliputi teks, gambar, audio, video, dan latihan interaktif, guna memfasilitasi pembelajaran bahasa Inggris yang kontekstual dan mandiri. Data akan dikumpulkan melalui angket analisis kebutuhan, instrumen validasi ahli, evaluasi guru, dan angket respons siswa. Analisis kuantitatif deskriptif akan digunakan untuk mengevaluasi validitas dan kepraktisan modul. Penelitian awal pada jenjang sekolah dasar menunjukkan bahwa modul bahasa Inggris digital berbasis Canva dapat memperoleh penilaian validitas dan kepraktisan yang baik; namun, temuan tersebut tidak dapat digeneralisasikan secara langsung pada konteks sekolah menengah. Penelitian yang diusulkan ini diharapkan dapat memberikan bukti mengenai kelayakan dan relevansi pendidikan dari penggunaan modul digital interaktif dalam pembelajaran bahasa Inggris di SMA Muhammadiyah Rappang. Penelitian ini juga diharapkan dapat berkontribusi terhadap pembelajaran bahasa berbantuan teknologi dengan menyediakan kerangka desain pembelajaran untuk mengembangkan sumber belajar digital yang mudah diakses, menarik, dan sesuai secara pedagogis pada jenjang pendidikan menengah di Indonesia.
Kata kunci: Model ADDIE; Modul Pembelajaran Digital; Teknologi Pendidikan; Pembelajaran Bahasa Inggris; Materi Pembelajaran Interaktif.

Abstract
The integration of digital technology into English language education has created opportunities to develop interactive learning resources that support students' engagement, accessibility, and independent learning. This study proposes the development of an interactive digital English learning module at SMA Muhammadiyah Rappang, Indonesia, using the Analysis, Design, Development, Implementation, and Evaluation (ADDIE) instructional design model. The proposed study is adapted from previous research on digital English module development in Indonesian primary education. It aims to identify students' learning needs, design interactive digital learning materials, and evaluate the validity and practicality of the developed module. A Research and Development (R&D) approach is proposed, involving needs analysis, instructional material design, digital module development, expert validation, and classroom implementation. The module is intended to integrate multimedia elements, including text, images, audio, video, and interactive exercises, to facilitate contextual and independent English learning. Data will be collected through needs assessment questionnaires, expert validation instruments, teacher evaluations, and student response questionnaires. Descriptive quantitative analysis will be employed to evaluate the module's validity and practicality. The original primary-school research demonstrated that a Canva-based digital English module could achieve favorable validity and practicality evaluations; however, these findings cannot be generalized directly to the secondary-school context. The proposed research is expected to provide evidence concerning the feasibility and educational relevance of interactive digital modules for English language instruction at SMA Muhammadiyah Rappang. The study may contribute to technology-enhanced language learning by offering an instructional design framework for developing accessible, engaging, and pedagogically appropriate digital learning resources in Indonesian secondary education.
Keywords: ADDIE Model; Digital Learning Modules; Educational Technology; English Language Teaching; Interactive Learning Materials.

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Introduction

The rapid advancement of digital technology has significantly transformed educational practices worldwide, including the teaching and learning of English as a Foreign Language (EFL). Digital technology provides opportunities for teachers to design innovative instructional materials that support student engagement, independent learning, and access to educational resources. In contemporary educational environments, technology is increasingly recognized not merely as a supplementary teaching instrument but also as an essential component of effective instructional design. The integration of multimedia, interactive exercises, and digital learning resources can create more flexible learning environments that accommodate students' diverse learning needs and preferences.

English language education in Indonesia continues to face challenges related to students' motivation, learning resources, classroom engagement, and opportunities for independent practice. Traditional instructional approaches often depend heavily on printed textbooks, teacher explanations, and conventional exercises. Although these approaches remain valuable, they may provide limited opportunities for students to interact with authentic multimedia materials and receive immediate feedback. Consequently, the development of interactive digital learning modules represents a promising approach to supporting English language instruction, particularly at the secondary school level.

Digital learning modules are instructional resources presented in electronic formats that integrate structured learning materials with multimedia elements, such as text, images, audio, video, and interactive activities. Unlike conventional printed modules, digital modules can provide flexible access to learning content and allow students to review materials according to their individual learning pace. Mayer (2009) emphasizes that meaningful learning can be supported when verbal and visual information are presented in ways that facilitate cognitive processing. Therefore, the integration of multimedia principles into digital learning materials may contribute to more effective instructional communication.

In English language learning, digital modules can support the development of linguistic competencies through integrated activities involving vocabulary, grammar, reading, listening, speaking, and writing. Students can engage with visual representations of vocabulary, listen to pronunciation models, watch contextual language demonstrations, and complete interactive exercises. These features may encourage active participation and provide additional opportunities for independent learning beyond conventional classroom instruction.

The development of digital learning resources is particularly relevant to Indonesian secondary education, where students are expected to develop communication skills, digital literacy, critical thinking, and independent learning abilities. Senior high school students encounter increasingly complex English language materials that require appropriate instructional support. Therefore, learning resources should not only present linguistic information but also encourage meaningful interaction, contextual understanding, and the practical application of English in everyday communication.

Previous research conducted by Hestiningrum (2024) investigated the development of a digital English learning

module at UPT SPF SDN Daya II Makassar. The study employed a Research and Development approach using the ADDIE instructional design model. The participants consisted of 28 fifth-grade students and one classroom teacher. The digital module was developed using Canva and distributed through an accessible digital link. The findings indicated that the module was highly needed, met the study's validity criteria, and received very practical evaluations from teachers and students.

These findings provide an important foundation for understanding the potential of digital learning modules in English language education. However, the original study focused on primary school students, whose learning characteristics, language proficiency, and instructional requirements differ from those of senior high school learners. Accordingly, the design and implementation of digital learning modules at the secondary school level require further investigation.

SMA Muhammadiyah Rappang is selected as the proposed research setting to examine the development of interactive digital English learning resources within an Indonesian secondary education context. The proposed study seeks to explore how digital instructional materials can be designed according to students' learning needs, curriculum requirements, and technological accessibility. The learning module is intended to incorporate relevant English language materials, multimedia presentations, contextual examples, and interactive assessment activities.

The Analysis, Design, Development, Implementation, and Evaluation (ADDIE) model provides a systematic framework for developing instructional products. Branch (2009) explains that the ADDIE model supports instructional development through interconnected stages that guide needs identification, learning design, product development, implementation, and evaluation. This systematic process is particularly appropriate for educational technology research because it encourages continuous improvement through feedback and revision.

Despite increasing interest in technology-enhanced language learning, the educational value of digital resources depends on more than their technological sophistication. Instructional materials must be pedagogically relevant, linguistically appropriate, accessible, and practical for classroom use. A visually attractive module may not necessarily support meaningful learning if its instructional content is poorly structured or inconsistent with students' learning objectives. Therefore, systematic validation by subject-matter and media experts is necessary to evaluate the quality of digital instructional products.

Furthermore, practicality evaluation is essential for understanding whether teachers and students can use digital modules effectively in actual learning environments. Practicality involves considerations such as ease of access, clarity of instructions, navigation, readability, technological compatibility, and suitability for classroom implementation. Feedback from teachers and students can provide valuable information for refining the module before broader educational application.

The novelty of the proposed study lies in adapting an interactive digital module development framework to the instructional requirements of senior high school EFL learners at SMA Muhammadiyah Rappang. Rather than simply transferring an existing primary-school module, the research

proposes developing learning content and interactive features appropriate to secondary education. This adaptation may contribute to a better understanding of how digital instructional design can respond to different educational levels and learning contexts.

Based on these considerations, the study aims to identify students' needs for interactive digital English learning materials, develop a digital module using the ADDIE instructional design model, and evaluate the validity and practicality of the resulting product. The research is expected to contribute to educational technology development by providing a systematic framework for designing accessible and pedagogically appropriate digital learning resources. It may also offer practical insights for English teachers seeking to integrate digital technology into secondary school instruction.

LITERATURE REVIEW

Educational technology refers to the systematic application of technological resources, instructional principles, and learning theories to improve educational processes. In English language teaching, educational technology enables teachers to present learning materials through various digital formats and facilitate interaction between students and instructional content.

Technology-enhanced language learning offers opportunities to integrate authentic language materials, multimedia resources, and interactive activities into classroom instruction. Chapelle (2003) emphasizes the importance of evaluating technology-supported language learning according to its pedagogical contribution rather than technological characteristics alone. Digital tools should therefore be selected and developed according to specific learning objectives and students' linguistic needs.

The integration of educational technology can also support learner autonomy. Students may access learning materials independently, review difficult concepts, and practice language skills beyond classroom hours. However, effective technology integration requires appropriate instructional planning, teacher guidance, and consideration of students' access to digital devices and internet connectivity.A digital learning module is a structured instructional resource delivered electronically to facilitate learning activities. Digital modules typically contain learning objectives, instructional explanations, examples, exercises, and assessment components.Interactive digital modules extend conventional electronic materials by incorporating features that encourage learners to participate actively in the learning process. Such features may include navigation menus, multimedia presentations, embedded videos, audio recordings, hyperlinks, quizzes, and feedback mechanisms.

In English language education, these components can support vocabulary development, pronunciation practice, grammatical understanding, and comprehension activities. For example, audio resources can provide pronunciation models, while videos can demonstrate language use in communicative contexts.Hestiningrum (2024) developed a Canva-based digital English learning module for primary school students using the ADDIE model. The study reported favorable validity and practicality evaluations, suggesting that appropriately designed digital modules can serve as feasible instructional resources. Nevertheless, the findings were limited to the original primary-school context and require further investigation before application to senior high school education.Multimedia learning theory provides an important theoretical foundation for designing interactive digital instructional materials. Mayer (2009) explains that

learning involves processing information through verbal and visual channels, both of which have limited cognitive capacity.

Effective multimedia instruction requires careful coordination between written explanations, visual illustrations, audio, and video. Presenting too much information simultaneously may increase cognitive demands and interfere with comprehension.

In digital English learning modules, multimedia principles can guide the presentation of vocabulary, grammar, and communicative activities. Images can illustrate word meanings, audio can demonstrate pronunciation, and short videos can provide contextual examples of language use.Therefore, multimedia elements should be selected according to instructional relevance rather than decorative attractiveness. The quality of a digital module depends on how effectively its technological features support students' understanding of learning materials.The ADDIE model is a systematic instructional design framework consisting of five stages: Analysis, Design, Development, Implementation, and Evaluation. It is widely used in educational technology research to guide the development of instructional materials.

During the Analysis stage, researchers identify students' learning needs, existing instructional problems, curriculum requirements, and technological conditions. The Design stage involves determining learning objectives, instructional strategies, content organization, and assessment procedures.The Development stage focuses on producing instructional materials and conducting expert validation. Implementation involves introducing the developed product to the intended users, while Evaluation examines the product's quality and identifies areas requiring improvement.

Branch (2009) emphasizes the importance of systematic instructional design in ensuring that educational products align with learning objectives and learner characteristics.For the proposed study, the ADDIE model provides a structured procedure for developing an interactive English learning module appropriate to SMA Muhammadiyah Rappang.Canva is a digital design platform that allows users to create visual instructional materials through templates, multimedia elements, illustrations, and interactive presentation features.

In educational settings, Canva can support the development of visually organized learning resources that combine text, images, audio, and video. Its design features may help teachers create materials that are attractive and accessible without requiring advanced programming knowledge.The original study by Hestiningrum (2024) used Canva to develop a digital English module distributed through a digital link. This approach demonstrates a possible technical foundation for developing learning resources in other educational contexts.However, the suitability of Canva-based modules for senior high school learners should be evaluated according to content complexity, accessibility, instructional effectiveness, and classroom practicality.Validity and practicality are important criteria in educational product development. Validity refers to the extent to which instructional materials meet relevant content, instructional design, and media quality standards.

Content validation may involve evaluating the accuracy of English language materials, curriculum alignment, instructional objectives, and appropriateness of learning activities. Media validation may examine visual presentation, navigation, readability, multimedia integration, and technological functionality.Practicality concerns the extent

to which a product can be used conveniently and appropriately by teachers and students. Practicality evaluation may include ease of operation, clarity of instructions, accessibility, usefulness, and compatibility with classroom conditions.A digital module that satisfies expert validation criteria may still require revisions if teachers or students encounter difficulties during implementation. Therefore, both expert validation and user evaluations are necessary to support product refinement.Previous research has demonstrated the potential of digital modules as instructional resources in English language education. However, differences in educational levels, learning objectives, and student characteristics require careful adaptation of digital instructional materials.

The original research by Hestiningrum (2024) focused on fifth-grade primary school students. The proposed study extends the development approach to senior high school learners at SMA Muhammadiyah Rappang, where English language learning involves different curriculum expectations and instructional demands.The conceptual framework connects students' learning needs, the ADDIE development process, interactive digital module design, expert validation, and practicality evaluation.The framework assumes that systematic instructional design can produce digital learning resources aligned with students' educational requirements. The validity and practicality of the developed module will be evaluated empirically rather than assumed.

METHOD

This study is designed to employ a Research and Development (R&D) approach to develop and evaluate an interactive digital English learning module at SMA Muhammadiyah Rappang, Sidenreng Rappang Regency, South Sulawesi, Indonesia.The research will use the ADDIE instructional design model, consisting of Analysis, Design, Development, Implementation, and Evaluation. This model is selected because it provides a systematic procedure for identifying learning needs, designing instructional resources, developing digital products, implementing learning materials, and evaluating their quality.

The primary objectives are to identify the need for an interactive digital English learning module, develop a module appropriate to secondary school learners, and determine its validity and practicality.The research is developmental rather than experimental. Accordingly, the proposed evaluation will focus on product quality and usability, not on establishing causal improvements in students' English proficiency.The proposed research will be conducted at SMA Muhammadiyah Rappang, an Indonesian senior high school located in Sidenreng Rappang Regency, South Sulawesi.

The target participants will consist of senior high school students and English teachers who are involved in English language learning activities. The grade level, sample size, and sampling procedures will be determined after consultation with the school administration and consideration of the curriculum materials selected for module development.Additional participants will include subject-matter and educational media experts who will evaluate the developed module.

The research will obtain institutional permission and follow applicable ethical procedures. Student participation will be voluntary, with appropriate consent arrangements for minors, and personal information will be kept confidential.The

development process will follow the five stages of the ADDIE model.

The Analysis stage will identify students' learning needs, existing instructional resources, curriculum requirements, and technological accessibility.

Needs assessment questionnaires will be distributed to participating students and teachers. The questionnaires will investigate the availability of digital learning resources, students' experiences with English learning materials, their preferences for multimedia content, and perceived difficulties in accessing instructional resources.The researcher will also review relevant English curriculum documents and instructional materials to determine appropriate learning objectives and content.

The findings will inform the module's instructional design and technological requirements.

During the Design stage, the researcher will prepare the instructional structure of the interactive digital English module.The design process will include determining learning objectives, selecting English language materials, organizing learning activities, and developing assessment instruments.The module will be designed to include an introductory section, learning objectives, instructional explanations, multimedia materials, interactive exercises, and evaluation activities.A storyboard will be developed to illustrate the organization and navigation of the module. Visual and multimedia elements will be selected according to the characteristics of senior high school students and the requirements of the selected learning topics.

The Development stage will involve producing the interactive digital English learning module using Canva and compatible multimedia resources.The researcher will integrate instructional explanations, illustrations, audio recordings, videos, and links to interactive exercises into a structured digital learning resource.Following initial development, the module will be reviewed by subject-matter and media experts.The subject-matter expert will evaluate the accuracy, relevance, and instructional appropriateness of the English learning content. The media expert will assess visual presentation, navigation, readability, multimedia integration, and technical accessibility.The module will be revised according to expert recommendations before classroom implementation.

The Implementation stage will involve introducing the developed module to participating students and English teachers at SMA Muhammadiyah Rappang.Students will be provided with instructions for accessing and navigating the module. The module will then be used during selected English learning activities.Teachers will facilitate the instructional process and provide feedback regarding the module's usability and relevance to classroom learning.After implementation, participating teachers and students will complete practicality questionnaires to evaluate their experiences using the module.

Evaluation will be conducted throughout the development process and after implementation.Formative evaluation will involve reviewing needs assessment findings, examining the initial module design, and revising the product based on expert feedback.The final evaluation will focus on the module's validity and practicality according to the collected assessment data.The researcher will summarize evaluation findings and identify

recommendations for further product improvement.

The proposed research will employ four principal instruments:

1. Needs assessment questionnaires: Used to identify students' and teachers' requirements for interactive digital English learning materials.
2. Content validation questionnaire: Used by English language education experts to assess the accuracy, curriculum relevance, instructional organization, and linguistic appropriateness of the module.
3. Media validation questionnaire: Used by educational technology experts to evaluate design quality, navigation, readability, multimedia integration, and accessibility.
4. Practicality questionnaires: Used by teachers and students to evaluate the module's ease of use, clarity, usefulness, and suitability for classroom learning.

The questionnaires will use a five-point Likert scale. Before administration, the instruments will be reviewed for clarity and relevance to the intended evaluation criteria.

Data will be collected through questionnaires, expert assessments, instructional documentation, and classroom implementation records.During the Analysis stage, needs assessment questionnaires will provide information about existing learning conditions and students' preferences for digital instructional resources.During Development, validation questionnaires will collect evaluations from content and media experts. Their written suggestions will guide module revision.During Implementation, teachers and students will use the module and complete practicality questionnaires. Their responses will provide information about accessibility, navigation, instructional clarity, and perceived usefulness.

Documentation will include module design materials, validation forms, revision records, and relevant implementation evidence.The collected data will be analyzed using descriptive quantitative and qualitative techniques.Quantitative analysis will be used to summarize needs assessment responses, expert validation scores, and practicality questionnaire results.The percentage of the obtained score will be calculated using the following formula:

P = (Obtained Score / Maximum Possible Score) × 100%

Where:

- P = Percentage of assessment achievement
- Obtained Score = Total score recorded from respondents
- Maximum Possible Score = Highest possible score for the assessment instrument

The resulting percentages will be interpreted using predefined assessment criteria for needs, validity, and practicality. These criteria will be established before data analysis and adapted appropriately from the evaluation framework used in the original development study.Qualitative data obtained from expert suggestions and participant comments will be organized into relevant themes to identify product strengths, weaknesses, and recommended revisions.The combination of numerical assessments and descriptive feedback will support a systematic evaluation of the developed digital English learning module.

The study will be conducted with permission from SMA Muhammadiyah Rappang and in accordance with applicable institutional research ethics.Participants will receive information about the research objectives, procedures, and intended use of the collected data. Participation will be voluntary, and students' identities will be protected through anonymous coding.The research will ensure that questionnaire responses and module evaluations are used exclusively for academic purposes. Students will not experience academic penalties for declining participation or providing critical feedback.These procedures are intended to support responsible educational research and maintain the confidentiality and welfare of participating students.

Alur Pengembangan Modul Digital



Figure 1. Proposed ADDIE-based development process for the interactive digital English learning module at SMA Muhammadiyah Rappang.

RESULTS AND DISCUSSION

The development of interactive digital English learning modules requires a systematic identification of students' instructional needs, existing learning resources, curriculum requirements, and technological accessibility. In the proposed study at SMA Muhammadiyah Rappang, the needs analysis will focus on determining the suitability of digital learning materials for secondary school English instruction.The analysis will examine several dimensions, including the availability of English learning resources, students' experiences with digital technology, their preferences for multimedia-based instruction, and teachers' expectations regarding instructional materials. Particular attention will be given to students' access to smartphones or other digital devices and the availability of internet connectivity.The original research conducted by Hestiningrum (2024) at UPT SPF SDN Daya II Makassar identified a strong need for digital English learning materials. The study reported that 90% of the 28 participating students considered English learning suitable for the development of digital resources incorporating text, images, audio, and video. This finding provides a relevant background for the proposed development study, although it does not represent the needs of students at SMA Muhammadiyah Rappang.

Table 1. Proposed Needs Analysis Indicators at SMA Muhammadiyah Rappang

No.	Needs Analysis Indicators	Data Source	Results
1	Availability of digital learning resources	Students and teachers	Pending
2	Accessibility of digital devices	Students	Pending
3	Preferences for multimedia learning materials	Students	Pending
4	Difficulties in learning English	Students and teachers	Pending
5	Need for interactive English learning modules	Students and teachers	Pending

The results of the needs assessment will determine the instructional requirements of the proposed module. The findings will also guide decisions concerning the selection of learning content, multimedia components, assessment activities, and technological delivery methods.

4.1.2. Design of the Interactive Digital English Learning Module

The Design stage involves preparing the instructional structure and visual organization of the digital English learning module. The module is intended to provide structured learning materials aligned with the curriculum and learning characteristics of senior high school students.

The proposed design includes learning objectives, instructional explanations, vocabulary activities, grammar exercises, multimedia resources, contextual examples, and formative assessments. Canva will be used as the primary design platform, while compatible digital tools may be integrated to support interactive learning activities.

The instructional content will be organized into manageable learning units to facilitate navigation and independent study. Multimedia components will be selected based on their instructional relevance and ability to support students' understanding of English language materials.

Table 2. Proposed Design Components of the Digital English Learning Module

Component	Description	Instructional Purpose
Cover and navigation	Module title, menus, and learning instructions	Facilitate access and navigation
Learning objectives	Expected learning competencies	Clarify instructional targets
English learning materials	Vocabulary, grammar, and communicative content	Develop linguistic understanding
Multimedia integration	Images, audio, and video	Support multimodal learning
Interactive exercises	Quizzes and language practice activities	Encourage active participation
Formative assessment	Learning evaluation and feedback	Monitor student understanding

Learning reflection	Self-assessment and reflection activities	Encourage independent learning

The module's design will be reviewed to ensure consistency between learning objectives, instructional content, activities, and assessment procedures.

The Development stage will involve transforming the instructional design into an interactive digital learning product. The module will be produced using Canva and relevant multimedia resources.

The initial product will undergo expert validation to determine its suitability for English language instruction. Content experts will assess the accuracy, relevance, organization, and curriculum alignment of the materials. Media experts will evaluate the module's visual design, readability, navigation, accessibility, and multimedia integration.

The original study by Hestiningrum (2024) reported that its digital English module satisfied the study's validity criteria. However, the validation outcomes from that primary-school product cannot establish the validity of the proposed secondary-school module.

Table 3. Proposed Expert Validation Results

Validation Aspect	**Obtained Score**	**Maximum Score**	**Percentage**	**Category**
Content accuracy	Pending	Pending	Pending	Pending
Curriculum relevance	Pending	Pending	Pending	Pending
Instructional organization	Pending	Pending	Pending	Pending
Visual presentation	Pending	Pending	Pending	Pending
Navigation and accessibility	Pending	Pending	Pending	Pending
Multimedia integration	Pending	Pending	Pending	Pending

The module will be revised according to expert recommendations. Revisions may involve improving instructional explanations, modifying visual elements, adjusting interactive activities, and addressing technical accessibility problems.The Implementation stage will involve introducing the digital module to participating English teachers and students at SMA Muhammadiyah Rappang. Students will access the module through the selected digital delivery method and complete learning activities under teacher guidance.

The practicality evaluation will investigate whether the module can be used conveniently in classroom instruction and independent learning. Teachers will evaluate instructional suitability, ease of implementation, and usefulness for English teaching. Students will evaluate navigation, readability, accessibility, multimedia presentation, and ease of completing learning activities.

Table 4. Proposed Practicality Evaluation Results

Evaluation Aspect	Teacher Evaluation	Student Evaluation
Ease of access	Pending	Pending
Clarity of instructions	Pending	Pending
Navigation and usability	Pending	Pending
Multimedia presentation	Pending	Pending
Suitability for English learning	Pending	Pending
Overall practicality	Pending	Pending

The practicality results will be analyzed using descriptive statistics and predefined assessment criteria. Qualitative comments from teachers and students will also be considered when identifying necessary improvements.The Evaluation stage will integrate information obtained from needs assessment, expert validation, and classroom practicality testing.Formative evaluation will be conducted throughout the development process, while the final evaluation will examine whether the developed module satisfies the predetermined validity and practicality criteria.The findings will be used to identify the module's strengths, limitations, and areas requiring improvement. The final product will be refined according to the evaluation evidence.The evaluation will not be interpreted as evidence of improved English achievement unless additional learning outcome assessments are conducted.

Discussion

The development of interactive digital English learning modules reflects the growing importance of educational technology in contemporary language instruction. Digital resources provide opportunities to integrate instructional content with multimedia presentation, interactive activities, and flexible access to learning materials.The original findings of Hestiningrum (2024) suggest that a systematically developed digital module can meet expert validation and user practicality criteria in a primary-school setting. This provides a useful methodological foundation for adapting digital learning materials to secondary education.However, the effectiveness of digital transformation depends on the relationship between technological features and pedagogical objectives. The inclusion of multimedia elements does not automatically improve learning. Digital instructional resources must be designed according to students' learning characteristics, linguistic needs, and curriculum expectations.

Mayer's (2009) multimedia learning theory emphasizes the importance of coordinating verbal and visual information to support meaningful learning. Therefore, the proposed module should integrate multimedia elements selectively, avoiding unnecessary visual complexity and excessive cognitive demands.The ADDIE instructional design model provides a systematic framework for developing educational products. Its five stages encourage researchers to establish learning needs, formulate instructional objectives, develop appropriate resources, evaluate product quality, and implement revisions.

Branch (2009) explains that instructional design requires alignment between learner characteristics, learning objectives, instructional activities, and evaluation procedures.In the proposed study, the Analysis stage will establish the instructional requirements of SMA Muhammadiyah Rappang students. The Design and Development stages will translate these requirements into structured digital learning

materials, while Implementation and Evaluation will generate evidence concerning product usability and quality.The iterative nature of ADDIE is particularly valuable because it allows the module to be revised based on expert and user feedback. Consequently, product development becomes a systematic educational process rather than merely a technological design activity.

Interactive digital modules can provide opportunities for students to engage with English language materials through multiple forms of representation. Images can support vocabulary comprehension, audio can demonstrate pronunciation, and videos can illustrate communicative situations.Interactive exercises may also encourage students to participate actively in learning activities. Rather than relying exclusively on teacher explanations, students can review instructional content, complete exercises, and monitor their understanding.Nevertheless, student engagement should be evaluated empirically. Positive responses to visual design or ease of navigation do not necessarily demonstrate increased motivation or improved language proficiency.The proposed practicality evaluation can provide evidence of students' perceptions and experiences, but additional instruments would be required to measure changes in motivation, participation, or learning outcomes.

Expert validation and practicality evaluation are essential components of educational product development. Content validation ensures that instructional materials are linguistically accurate, curriculum-relevant, and appropriate for the intended learners.Media validation examines technological and visual characteristics, including navigation, readability, accessibility, and multimedia organization. Practicality evaluation focuses on whether teachers and students can use the module effectively in their learning environment.

The original study by Hestiningrum (2024) reported favorable validity and practicality evaluations. These findings support the feasibility of the development approach but do not establish the quality of a new module intended for SMA Muhammadiyah Rappang.Therefore, the proposed study must conduct independent expert validation and user testing before drawing conclusions about the developed product.The proposed interactive digital English learning module may offer practical benefits for teachers and students by providing structured instructional reources that can be accessed during and beyond classroom activities.For teachers, digital modules may facilitate the presentation of vocabulary, grammar, and communicative learning materials through multimedia resources. They may also provide supplementary exercises and assessment activities.For students, digital modules may support independent review, repeated practice, and flexible engagement with learning materials. Such opportunities are relevant to developing learner autonomy in EFL education.However, the pedagogical value of the module will depend on its instructional quality, accessibility, and integration into classroom practice. Teacher guidance remains important in ensuring that students use digital resources meaningfully.

The proposed study contributes to educational technology research by adapting a digital English module development framework from primary education to an Indonesian senior high school context.

Its anticipated contribution lies in the systematic development and evaluation of a digital instructional product aligned with secondary-school learning requirements.

Several limitations should be considered. First, the original primary-school findings cannot be generalized directly to SMA Muhammadiyah Rappang. Second, expert validation and practicality assessments do not independently establish instructional effectiveness. Third, technological accessibility may influence students' experiences using the module.

Future studies may investigate the module's effects on vocabulary mastery, reading comprehension, writing proficiency, motivation, or other measurable English learning outcomes through appropriate experimental or quasi-experimental designs.

CONCLUSION

The development of interactive digital English learning modules represents a promising approach to integrating educational technology into secondary school English language instruction. The Research and Development approach using the ADDIE instructional design model provides a systematic framework for identifying students' learning needs, designing instructional materials, developing multimedia-based resources, implementing digital learning activities, and evaluating product quality. Previous research conducted by Hestiningrum (2024) demonstrated that a Canva-based digital English module could satisfy validity and practicality criteria in an Indonesian primary-school context. However, these findings cannot be directly generalized to senior high school learners because of differences in educational characteristics, curriculum requirements, and instructional needs.

The proposed study at SMA Muhammadiyah Rappang aims to extend this development framework to secondary education by producing an interactive digital English learning module appropriate to students' linguistic needs and technological conditions. Expert validation and practicality evaluation will be essential for determining the quality, accessibility, and instructional suitability of the developed product. The module is expected to integrate structured English learning materials with multimedia components, interactive exercises, and formative assessments to support flexible and engaging learning experiences. Nevertheless, conclusions concerning the module's validity, practicality, and educational effectiveness must be based on empirical findings obtained from the intended research setting.

The study has potential implications for English teachers, instructional designers, and educational institutions seeking to develop technology-enhanced learning resources. Systematically designed digital modules may provide supplementary opportunities for independent learning, contextual language practice, and classroom interaction. Future research should investigate their effects on measurable English learning outcomes, including vocabulary acquisition, reading comprehension, writing proficiency, and learner motivation. Such investigations would provide stronger evidence regarding the educational contribution of interactive digital learning modules in Indonesian secondary education.

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