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THE DEVELOPMENT OF ENGLISH LANGUAGE LEARNING MULTIMEDIA BASED ON PROBLEM-BASED LEARNING USING LINKTREE

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Abstract

This research aimed to develop English multimedia learning based on the Problem-Based Learning (PBL) model using the Linktree platform for instructional text material at SMP Swasta Santo Thomas 1 Medan. The study followed the ADDIE development model without testing effectiveness, focusing solely on producing a feasible and relevant learning product. The analysis phase revealed that students encountered significant difficulties in understanding the structure and language features of instructional texts, and that the learning process lacked interactive digital media. In response, a multimedia product was developed by integrating PBL principles to foster student collaboration and critical thinking. The Linktree platform was selected to structure all learning materials, assignments, and activities into a single accessible interface. The developed media was validated by subject matter experts, instructional design experts, and media experts, all of whom rated it as 'very feasible.' Subsequent individual, small group, and large group trials involving students also showed high levels of acceptance and usability. These findings indicate that the developed media is practical and appropriate for supporting 21st-century English learning at the secondary school level.

INTRODUCTION

The development of digital technology in the 21st century has triggered a significant transformation in global education, including in Indonesia (Liu et al., 2025; Nsabayezu et al., 2025; Redondo-Sama et al., 2025). The implementation of the Merdeka Curriculum marks a crucial milestone in encouraging the integration of technology into learning, emphasizing collaborative, creative, and project-based approaches (Durriyah et al., 2024; Mayer, 2021; Sahara et al., 2025; Sibuea et al., 2023). In this context, interactive and technology-based learning media have become essential to support 21st-century competencies, including critical thinking, collaboration, communication, and creativity (4Cs) (Redondo-Sama et al., 2025; Weng et al., 2022). Unfortunately, real-world conditions still reflect several challenges, including the inconsistent use of technology, low student engagement, and learning processes that are not yet fully adaptive to students' needs (Mark & Emmanuel, 2019).

One of the main challenges at SMP Santo Thomas 1 Medan lies in the limited use of integrated and innovative digital learning media, particularly in English language instruction (Indah et al., 2022). Based on preliminary observations and academic evaluation results, many students have not yet met the Learning Objectives Achievement Criteria (KKTP), especially in the "Instructional Text" topic, which requires understanding text structure, procedural delivery, and the use of functional language. Furthermore, the learning process has not fully applied contextual and problem-solving-based approaches, resulting in low motivation and enthusiasm among students.

The development of adaptive and accessible technology-based learning media has thus become crucial in addressing these challenges (Kong et al., 2022; Lau Yen Yen et al., 2023). One proposed solution is the use of the Linktree platform as an integrative tool that allows teachers to manage learning materials, video links, quizzes, and assignments within a single, simple digital page. The selection of Linktree is based on instructional design principles that emphasize ease of navigation and hierarchical content organization to facilitate accessibility and learning engagement (Merrill, 2002). Moreover, this approach aligns with Sweller's Cognitive Load Theory (Sweller et al., 1998), which stresses the importance of minimizing cognitive load through intuitive interfaces, enabling students to focus on the learning content without being distracted by technical complexity. Thus, the use of Linktree is not solely due to its simplicity, but also because it supports learning efficiency based on sound pedagogical principles.

Previous studies have shown that platforms such as Linktree can effectively support online learning by improving students' access to various learning resources through a centralized link (Juanda et al., 2022). However, it is important to note that Linktree is fundamentally a link aggregator, not an interactive instructional platform like Google Sites, Moodle, or Canva, which offer integrated learning features. Therefore, the effectiveness of Linktree in educational contexts depends largely on how teachers design and curate links to interactive media that promote personalization and learning engagement, rather than the platform's built-in features.

The Problem-Based Learning (PBL) approach is adopted as the main pedagogical framework for this media development to optimize learning effectiveness (Munawaroh, 2020; Safarati & Zuhra, 2023; Suhada et al., 2023). The PBL model has consistently been shown to enhance critical thinking, problem-solving skills, and promote contextual and collaborative learning experiences (Hmelo-Silver, 2004; Nirmayani & Suastra, 2023). In the context of English language learning, applying PBL to the development of "Instructional Text" allows students to construct procedural texts in the form of creative and practical leaflets relevant to real-world contexts (Ghufron & Ermawati, 2018; Ismail & Edi, 2023).

This media development research offers an alternative solution by designing an integrative Linktree-based platform that supports the implementation of the PBL model. The platform enables the integration of various learning components such as contextual videos, problem-based tasks, and discussion forums into a single, simple interface. This flexibility makes the media more adaptive to the needs of both teachers and students, especially in schools with limited resources and digital literacy.

The development of Linktree-based learning media within the PBL framework represents an innovative, accessible, and contextually relevant approach to 21st-century education needs. This effort aligns with UNESCO's educational principles (Irayanti & Komalasari, 2023) and Edgar Dale's Cone of Experience theory, which emphasizes the importance of concrete learning experiences through the appropriate use of media. The developed digital media not only serves as a content delivery tool but also as a space for interaction and exploration, ultimately enhancing the quality of the learning process.

Based on the above explanation, the research question addressed in this study is: How can Problem-Based Learning-based English language learning media be developed using Linktree for the Instructional Text topic at SMP Santo Thomas 1 Medan? The main objective of this study is to produce an innovative and structured design and product of digital learning

media tailored to the characteristics of students and the needs of English language learning at the junior high school level. This study does not focus on testing effectiveness but rather on the development stage of the media as a tangible contribution to improving the learning process.

METHOD

This study employs a research and development (R&D) approach with the primary objective of producing a digital learning media product in the form of interactive English multimedia based on Problem-Based Learning (PBL), utilizing the Linktree platform (Fu & Zhang, 2020). The development process follows the ADDIE model (Widyastuti, 2019), which consists of five systematic stages: Analysis, Design, Development, Implementation, and Evaluation, as illustrated in Figure 1 below.

Figure 1. ADDIE Model

This model was chosen because it provides a structured framework that enables iterative improvement of the product until it meets the quality standards aligned with user needs. The research was conducted at SMP Santo Thomas 1 Medan.

In the Analysis stage, a needs assessment was carried out to identify students' learning gaps, particularly in mastering the Instructional Text material in English subjects. Data were collected through observations, interviews with teachers, and questionnaires administered to both teachers and students to explore the current learning conditions, encountered obstacles, and readiness to use digital media. This analysis also covered students' characteristics, the availability of learning resources, and the formulation of learning objectives.

In the Design stage, media planning was conducted, which included designing content, display flow, and the integration of learning materials into the Linktree platform. The design was structured based on the principles of the Problem-Based Learning (PBL) model, in which students are guided to understand and solve real-world problems through meaningful language activities.

The Development stage focused on producing the multimedia product based on the previously constructed blueprint. Content such as instructional videos, learning resource links, interactive exercises, and other supporting materials were developed and arranged in a digital format using the Linktree platform. This multimedia development process took place over the course of one month, including content planning, media production, and integration into the platform. Once the multimedia product was completed, it was subjected to a

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feasibility evaluation by six experts: two subject matter experts, two instructional design experts, and two media experts.

The feasibility of the media was assessed using a 5-point Likert scale, validated by the six experts using Aiken's V technique (Aiken, 1980). The instrument used for the feasibility test was a questionnaire containing specific feasibility criteria as shown in Table 1. In addition to quantitative analysis, qualitative data in the form of expert comments and suggestions were analyzed using thematic analysis to identify patterns, categories, and key issues that emerged during the validation process.

Table 1. Feasibility criteria

Score	Criteria	Average interval
5	Very Feasible	(85% ≤ X ≤ 100%)
4	Feasible	(75% ≤ X ≤ 84%)
3	Less Feasible	(65% ≤ X ≤ 74%)
2	Not Feasible	(55% ≤ X ≤ 64%)
1	Very Inappropriate	(0% ≤ X ≤ 54%)

The Implementation stage involved applying the developed media in a real classroom learning context. The PBL-based Linktree media was tested in an experimental class over a period of two weeks, with the aim of evaluating its usability in an actual learning environment. During this stage, three trials were conducted: individual testing involving 3 students, small group testing involving 15 students, and large group testing involving all students in the experimental class. These stages were carried out to assess the ease of use, students' enthusiasm, and the alignment of the material with learning needs. Prior to implementation, both the teacher and students involved were given a briefing session after the product had been validated and declared feasible by the expert team.

In the Evaluation stage, improvements were made based on feedback from subject experts, teachers, and students regarding the developed multimedia. The focus of this study was fully directed toward the development of a feasible, innovative learning media that aligns with the contextual demands of 21st-century English language learning.

RESULT AND DISCUSSION

The following section outlines the outcomes of developing English learning media based on the Problem-Based Learning (PBL) model using the Linktree platform, implemented through the five systematic phases of the ADDIE framework.

Result

1) Analysis Phase

The results of observations, interviews, and questionnaires distributed to teachers and students at SMP Swasta Santo Thomas 1 Medan revealed that English language learning, particularly in the *Instructional Text* material, faces several challenges. Students generally struggle to understand the structure and linguistic elements of instructional texts and are not yet able to construct logical and communicative sentences. Teachers reported that the learning process tends to remain conventional and lacks the support of interactive digital media. One teacher stated, *"We sometimes use Canva or Wordwall, but students have to open multiple separate links, so the learning process feels disconnected."* This indicates that while the use of technology has begun, comprehensive integration has not yet been achieved.

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The needs analysis questionnaire showed that more than 70% of students had never used Linktree as a learning medium, but 82% expressed interest in using structured and easily accessible digital media. One student commented, *"If all the assignments and videos were collected in one place, I wouldn't be confused about which link to open anymore."* In addition, based on learning outcome data, approximately 34% of students had not yet met the minimum KKTP standard, indicating an urgent need for a more effective and engaging learning approach.

In response to these findings, a Linktree-based multimedia learning platform was developed by integrating the principles of Problem-Based Learning (PBL). PBL was chosen because it encourages students to actively solve problems, think critically, and collaborate in composing instructional texts. Meanwhile, Linktree was selected not only for its ease of access but also for its ability to consolidate materials, videos, assignments, and learning resources into a single, simple yet well-structured interface. This development is expected not only to overcome technical barriers in the learning process but also to foster a more cohesive, reflective, and contextually relevant learning experience in line with 21st-century education demands.

2) Design Phase

The design stage focused on structuring and initially planning the multimedia learning media based on Linktree, which was developed in response to the findings from the analysis stage. Considering the previously identified challenges particularly students' difficulties in understanding how to write instructional texts and the low level of technology integration in the learning process this media design was directed toward creating a learning experience that is more engaging, structured, and easily accessible to students.

The Problem-Based Learning (PBL) model was integrated into the design as the primary instructional approach to foster critical thinking and problem-solving skills. Through PBL, students are guided to work collaboratively in completing problem-based tasks that are directly relevant to real-life situations. The initial design of the media is illustrated in Figure 2 below.

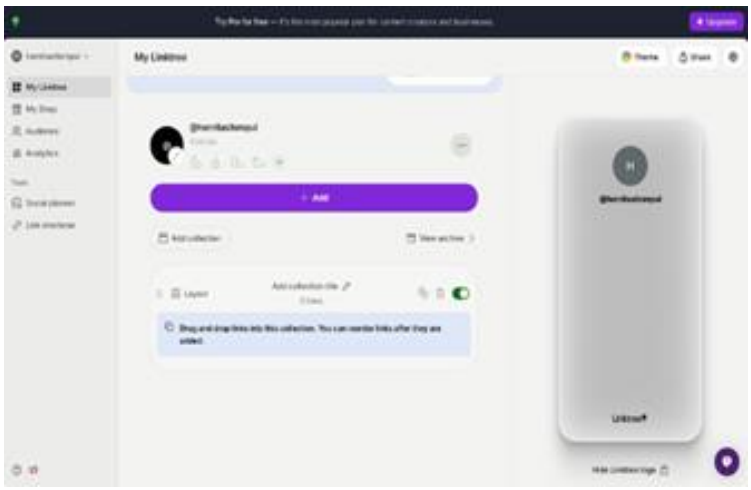

Figure 2. Early design of the media

3) Development Phase

The development stage represents the realization process of the media design formulated in the previous stage. At this point, the multimedia learning media based on Problem-Based Learning (PBL) using the Linktree platform was fully developed and ready for

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feasibility testing. This media was designed to support English language learning, specifically in the Instructional Text topic, by presenting a variety of learning content and activities within a single, integrated digital page. Figures 3 to 5 below display the final interface of the developed multimedia.

Figure 3. Homepage

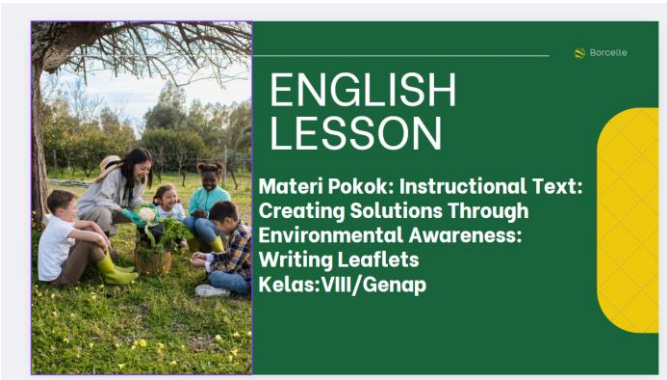

Figure 4. Material page

Figure 5. Video page

Once all components of the media had been fully developed, the next stage was feasibility testing by qualified experts. Three groups of experts were involved in the validation process: subject matter experts, instructional design experts, and media experts. The

following presents the feasibility test results from the Subject Matter Experts, as shown in table 2:

Table 2. Feasibility Test by Subject Matter Experts

No	Aspect	Average	Value (%)	Criteria
1	Feasibility of content	4,0	100	Very feasible
2	Feasibility of presentation	3,8	95	Very feasible
3	Contextual presentation	4,0	100	Very feasible
4	Learning using the Problem based learning model	3,8	95	Very feasible
Average		3,9	97,5	Very feasible

Table 1 presents the feasibility test results of the multimedia learning media based on Problem-Based Learning (PBL) using the Linktree platform, as assessed by subject matter experts. Four aspects were evaluated: content feasibility, presentation, contextual relevance, and PBL model implementation. The highest scores were achieved in the aspects of content feasibility and contextual relevance (4.0), while presentation and PBL implementation each received a score of 3.8. The overall average score was 3.9, with a total score of 97.5, which falls under the "Highly Feasible" category. These results indicate that the media meets high standards in both content quality and the application of the PBL approach. The feasibility test results from Instructional Design Experts are presented in Table 2 below:

Table 2. Feasibility Test by Instructional Design Experts

No	Aspect	Average	Value (%)	Criteria
1	The accuracy of the formulation of learning objectives	4,0	100	Very feasible
2	Learning Process Interaction	3,8	95	Very feasible
3	Attractive and accuracy of the linktree application	4,0	100	Very feasible
	Average	3,9	98,3	Very feasible

Table 2 presents the assessment results from instructional design experts regarding the Problem-Based Learning media using the Linktree platform. Three aspects were evaluated: the appropriateness of learning objectives, learning process interaction, and the appeal and suitability of Linktree usage. Two aspects received a score of 4.0 (“Highly Feasible”), while the aspect of learning interaction received a score of 3.8. The overall average score was 3.9, with a total score of 98.3, which is categorized as "Highly Feasible." These results indicate that the media was appropriately designed interactive, visually appealing, and functionally effective. The feasibility test results from media experts are presented in Table 3 below:

Table 3. Feasibility Test by Media Experts

No	Aspect	Average	Value (%)	Criteria
1	Instructions/ guidelines	4,0	100	Very feasible
2	Media content quality	3,7	92,50	Very feasible
3	Media display	4,0	100	Very feasible
4	Media efficiency	3,7	92,50	Very feasible
	Average	3,9	96,3	Very feasible

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Table 3 presents the feasibility test results of the Problem-Based Learning media on the Linktree platform as evaluated by media experts. Four aspects were assessed: usability instructions, content quality, visual display, and efficiency. The highest scores were given to usability instructions and visual display (4.0), while content quality and media efficiency received scores of 3.7. The overall average score was 3.9, with a total score of 96.3, which falls under the "Highly Feasible" category.

These evaluations indicate that the media was rated highly in terms of ease of use, visual appeal, and effectiveness in content delivery. After being declared highly feasible by subject matter experts, instructional design experts, and media experts, the next step was to conduct student trials during the implementation stage to assess the media's acceptability and usability in actual learning contexts.

4) Implementation Phase

The implementation stage is the process of applying the developed learning media in a real learning context to evaluate its usability, ease of use, and initial user responses. At this stage, the Linktree-based learning media, designed using a Problem-Based Learning (PBL) approach, was gradually tested on students at SMP Swasta Santo Thomas 1 Medan. The data presented in Table 4 shows the results of student trials, which consisted of individual testing involving 3 students, small group testing with 15 students, and large group testing involving all students from class VIII-J.

Table 4. Student Trial Results

No	Trial Class	Average	Score (%)	Criteria
1	Individual	3,90	97,5	Very good
2	Small Group	3,96	99	Very good
3	Large Group	3,98	99,5	Very good
Average		**3,95**	**98,67**	**Very good**

Table 4 above presents the results of the trial implementation of the Problem-Based Learning media using the Linktree platform. The trials were conducted in three stages: individual testing, small group testing, and large group testing.

In the individual testing phase, the media received an average score of 3.90, equivalent to 97.5%, which falls into the "Excellent" category. In the small group testing, an average score of 3.96 (99%) was achieved, while the large group testing reached an average of 3.98 (99.5%). Overall, the total average score across all three testing stages was 3.95, with a percentage of 98.67%, also categorized as "Excellent." These results indicate that the media was highly accepted by students across all scales of testing individual and group demonstrating that it is suitable for use in actual classroom learning.

5) Evaluation Phase

The evaluation stage represents the final phase in the development of learning media, aimed at assessing the feasibility, quality, and relevance of the product based on feedback from experts and end users. The evaluation was conducted formatively by collecting input from various stakeholders, including expert lecturers, subject teachers, and students as the direct users of the learning media.

In this process, the expert lecturers consisting of subject matter experts, media experts, and instructional design experts provided evaluations on aspects such as content quality, visual presentation, navigation, and the alignment of the media with the Problem-Based

Learning approach. All feedback was thoroughly reviewed to identify areas of the media that required improvement, both technically and pedagogically. English subject teachers were also involved in giving feedback related to the practicality of using the media in the classroom and its suitability to students' characteristics and curriculum demands.

Additionally, students who participated in the media trials provided evaluations on the visual appeal, ease of access, clarity of instructions, and the overall learning experience. Student feedback served as a crucial component in determining whether the developed media could effectively enhance learning interest and provide a meaningful and enjoyable learning experience.

Discussion

The findings of this study indicate that the development of Problem-Based Learning (PBL)-based English learning media through the Linktree platform effectively addresses key challenges in 21st-century education. The primary finding, which highlights students' need for structured, engaging, and easily accessible learning media, reflects the transformation of learners into more digital-native and independent individuals. In this context, conventional teaching methods and fragmented digital media are no longer sufficient to support effective learning particularly in Instructional Texts, which require logical understanding and language structure mastery.

The successful integration of PBL into the multimedia design signifies a reinforcement of student engagement through explorative, problem-solving, and collaborative activities. While PBL fosters contextual learning experiences, Linktree provides an aggregative system that consolidates various learning components into a single, simple, and efficient interface. This alignment allows students to access materials more systematically and flexibly, while also offering teachers greater freedom in designing learning sequences. These findings are in line with Ismail & Edi (2023), who emphasized that PBL enhances engagement and comprehension in academic reading, and are further supported by Zhou (2024), who underscores the importance of flexibility and user support in educational technology integration.

Comparatively, this study offers clear distinctions from previous research. For example, Fitriani et al. (2021) developed a PBL-based e-module focusing solely on textual content, while (Kartika & Zakir, 2022) designed an Android-based media that lacked centralized instructional flow. In contrast, the media developed in this study demonstrates a higher degree of integration, combining text, video, quizzes, and project-based assignments within a single cross-platform system via Linktree. This results in a more coherent, navigable, and integrated learning experience for both teachers and students.

These findings also reflect a broader trend: the shifting expectations toward learning media in the digital transformation era. Today's students not only demand high-quality content but also delivery systems that offer quick access, independent learning experiences, and cross-device integration. In this context, student remarks such as "everything is in one place" illustrate how a concise yet functional interface design significantly impacts learning effectiveness.

Theoretically, this study reinforces the notion that integrating active learning strategies like PBL with aggregative, technology-based media can lead to more contextualized, structured, and participatory learning systems. Practically, this research provides a tangible contribution in the form of a simple, cost-effective, and easily implementable media that

teachers can adopt without advanced technical skills. As such, Linktree serves as a strategic option for developing instructional media in secondary schools, especially in contexts with limited technological infrastructure.

However, this study has several limitations. As an aggregative platform, Linktree is static and lacks interactive or gamification features that may cater to diverse learning styles such as visual or kinesthetic preferences. Moreover, its reliance on stable internet access can pose challenges, particularly in schools with limited digital infrastructure.

Looking ahead, future research is needed to examine the long-term effectiveness of this media across various educational levels and social settings. Additionally, integrating this media with other platforms that offer interactive features, as well as developing teacher training programs to enhance technological proficiency in PBL implementation, will be essential for scaling and sustaining the impact of this innovation.

CONCLUSION

The findings of this study indicate that the English learning media based on Problem-Based Learning (PBL), developed through the Linktree platform, was rated as highly feasible by experts and very well received by students. These outcomes were achieved through a series of development stages following the ADDIE model, from needs analysis to final evaluation. The results address the research objective: to produce a learning media that is relevant to students' needs and capable of enhancing their engagement and understanding of Instructional Texts.

Scientifically, this development contributes significantly to the practice of instructional media design by offering an integrative approach that combines PBL strategies with aggregative digital technology. The novelty of this research lies in the use of Linktree as a structured platform that facilitates the presentation of learning materials, assignments, videos, and assessments within a single, accessible and flexible system an approach that has not been widely utilized systematically in problem-based learning contexts. With this model, the developed media not only resolves the technical challenges of integrating learning resources, but also aligns the learning process with the characteristics of the digital-native generation and the demands of 21st-century education.

However, this study has limitations, particularly regarding the technical constraints of the Linktree platform, which is static in nature and requires a stable internet connection. Therefore, its use should be adjusted based on the school's infrastructure conditions. Future research is recommended to explore the long-term effectiveness of this media across broader implementation scales, including at different educational levels or in other subject areas. In addition, integrating this media with more interactive and adaptive technologies may serve as the next step in improving the quality of digital learning in a sustainable way.

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