



Developing Pop-Up Book-Based Interactive English Learning Media for Students with Special Needs

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Abstrak

Bahasa Inggris merupakan bahasa Internasional yang sangat penting untuk dikuasai oleh generasi penerus bangsa. Hal ini berlaku bagi semua generasi penerus bangsa, termasuk mahasiswa dengan kemampuan tinggi, sedang, maupun mahasiswa berkebutuhan khusus. Namun demikian, terdapat berbagai macam kendala bagi para dosen/guru untuk menyampaikan materi pembelajaran bahasa Inggris bagi mahasiswa berkebutuhan khusus. Mahasiswa memiliki kendala seperti keterbatasan dalam mendengar ataupun kesulitan memahami kalimat-kalimat panjang pada buku ajar. Penelitian ini bertujuan untuk mengembangkan media pembelajaran bahasa Inggris interaktif berbasis buku pop-up. Penelitian ini menggunakan metode Penelitian Desain dan Pengembangan (DDR), yang terdiri dari tiga tahap: analisis, desain dan pengembangan, dan evaluasi. Model ini mengacu pada pendapat Richey, yang menjelaskan bahwa metode DDR sangat tepat untuk mengembangkan produk pendidikan dan sumber belajar karena memfasilitasi konstruksi pengetahuan dan keterampilan yang terintegrasi dalam kegiatan pembelajaran. Data dikumpulkan melalui kuesioner, wawancara, dan analisis dokumen yang melibatkan 25 mahasiswa berkebutuhan khusus di Universitas Sahid Surakarta. Hasil penelitian menunjukkan bahwa 80% mahasiswa menunjukkan minat yang tinggi dalam belajar bahasa Inggris melalui media berbasis visual, sementara 56% mengalami kesulitan memahami materi pembelajaran tanpa dukungan visual. Lebih lanjut, 80% mahasiswa menyatakan preferensi yang kuat terhadap metode pembelajaran interaktif dan visual. Berdasarkan temuan ini, media pembelajaran berbasis buku pop-up dikembangkan dan dievaluasi oleh para ahli. Hasil evaluasi menunjukkan bahwa media tersebut tepat, efektif, dan sesuai dengan karakteristik mahasiswa. Tes terbatas yang dilakukan pada mahasiswa menunjukkan peningkatan prestasi belajar bahasa Inggris setelah menggunakan buku pop-up interaktif. Skor rata-rata pre-tes adalah 61,20, meningkat menjadi 78,80 pada post-tes, yang menunjukkan peningkatan rata-rata sebesar 17,60 poin. Perolehan yang dinormalisasi (N-gain) adalah 0,45, yang termasuk dalam kategori sedang. Hasil ini menunjukkan peningkatan moderat dalam prestasi belajar siswa setelah penggunaan media yang dikembangkan. Oleh karena itu, media visual interaktif seperti buku pop-up dapat meningkatkan keterlibatan, pemahaman, dan motivasi siswa dalam belajar bahasa Inggris.

Kata kunci: buku pop-up, media pembelajaran interaktif, pembelajaran bahasa Inggris, siswa berkebutuhan khusus

Abstract

English is an international language that is very important for the next generation to master. This is important for all future generations, including students with high abilities and students with special needs. However, there are various obstacles for lecturers in delivering English learning materials for students with special needs. Students face challenges such as limited hearing or difficulty understanding long sentences in textbooks. This study aims to identify the learning needs of students with special needs and develop interactive English learning media based on pop-up books. This study uses the Design and Development Research (DDR) method, which consists of three stages: analysis, design and development, and evaluation. This model refers to Richey's opinion, which explains that the DDR method is very appropriate for developing educational products and learning resources because it



facilitates the construction of knowledge and skills integrated in learning activities (Richey: 2007). Data were collected through questionnaires, interviews, and document analysis involving 25 students with special needs at Sahid University Surakarta. The results showed that 80% of students showed a high interest in learning English through visual-based media, while 56% had difficulty understanding learning materials without visual support. Furthermore, 80% of students expressed a strong preference for interactive and visual learning methods. Based on these findings, pop-up book-based learning media was developed and evaluated by experts. The evaluation results showed that the media was appropriate, effective, and suited to student characteristics. The limited student test indicated an improvement in students' English learning achievement after using the interactive pop-up book. The mean pre-test score was 61.20, increasing to 78.80 in the post-test, representing a mean improvement of 17.60 points. The normalized gain (N-gain) was 0.45, which falls within the medium category. This result indicates a moderate improvement in students' learning achievement following the use of the developed media. Therefore, interactive visual media such as pop-up books can enhance students' engagement, comprehension, and motivation in learning English.

Keywords: English learning, interactive learning media, pop-up book, special needs students

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Introduction

Education is a process of humanism which is known as the term humanizing humans (Desi et al, 2022). Everyone has the right to an education, even students with special needs. It has been widely stressed that inclusive education is important, all students should be served equally, and that the idea that certain students are more valuable than others or have greater opportunities to achieve academically should also be rejected (Makeleni & Onyinyechi Glory Ndu, 2025). Nonetheless, students with special needs frequently face considerable obstacles in their learning processes due to constraints in communication, cognition, and sensory capabilities (Knoors & Marschark, 2020; Marschark & Hauser, 2021).

In the context of education, children with special needs require greater attention and support than children in general (Gumindra & Nafia, 2020). This occurs because there are intellectual and physical differences that affect their ability to deal with various learning challenges. Therefore, (Yuwono, 2020) emphasizes that providing opportunities for children with special needs to interact in the learning process also has a positive impact on fostering sympathy from regular students. This perspective also applies to students in higher education, or what we often call university students. They can still learn through the use of total communication and speech reading (Haliza et al., 2020).

In the context of English language learning, these challenges become more complex because language acquisition requires not only cognitive processing but also communicative competence and auditory skills. Mayer (2020) states that effective learning occurs when students process information through multiple modalities, particularly visual and auditory channels. However, students with hearing impairments and other disabilities tend to rely more heavily on visual input to understand learning materials (Haliza et al., 2020; Zhang et al., 2021). Therefore, the use of visual and interactive learning media becomes essential in facilitating meaningful learning experiences. Referring to previous research, the strategies used in the English learning process are expository, Contextual Teaching and Learning (CTL), and peer tutoring. However, there is still little research that reveals which teaching materials are appropriate for the needs of children with special needs

Furthermore, the limited use of innovative learning media is one factor hindering the effectiveness of English learning at the university level. However, engaging and interactive media can help students better understand the material. One potential alternative is the use of pop-up books. This visual and interactive media can increase student motivation, engagement, and learning outcomes (Yulianto et al., 2020). Therefore, the

development of pop-up book-based learning media is expected to provide a more engaging learning experience, enrich the understanding of students with disabilities, and support the improvement of English literacy in the learning environment. A pop-up book is a card or book that, when opened, presents a three-dimensional or raised structure (Ningtiyas et al., 2022). According to Dzuanda Rahmawati (Rahmawati, 2013), pop-up books have various very useful benefits, including; teaching students to have a sense of respect for books by caring for and maintaining them properly while using them, providing opportunities for students to bond more closely with teachers or parents, enhancing student creativity, fostering student imagination, increasing student knowledge and provides descriptions of objects, as well as fostering children's love of reading.

Various studies on improving literacy by applying technology have been conducted. A study describes the implementation of flipbooks as interactive media for students with disabilities, particularly for vocabulary (Rifai, et al., 2024). Furthermore, Rama & Antara, (2024) revealed that interactive books are more beneficial in helping students imagine and realistically understand a learning topic. Referring to these studies, this study differs from previous research. This is reflected in the research subjects, research methods, teaching materials, and the learning media to be developed.

Other previous studies have highlighted various strategies to support English learning for students with special needs. Similarly, Yuwono, (2020) developed a learning model tailored for students with special needs in higher education, demonstrating that adaptive strategies can enhance participation. In addition, Gumindra and Nafia, (2021) proposed joyful learning approaches that integrate social constructivism principles to support student motivation.

The integration of technology-based learning media has also been widely explored. Zainuddin et al., (2020) and Al-Azawei et al., (2020) argue that technology-enhanced learning can improve accessibility and flexibility in education. This is also supported by Anderson and Dron, (2020), who explain that the evolution of digital learning environments has shifted toward more interactive and learner-centered approaches. Furthermore, Huang et al., (2020) highlight that flexible and adaptive learning systems are crucial in supporting diverse learners, especially in inclusive education

settings. Kumar and Nanda, (2022) also emphasize that social media can function as an effective tool to increase engagement and collaborative learning. Rabiassa et al., (2024) found that animated video-based learning media significantly increased students' motivation and learning interest. Furthermore, Pieter et al., (2024) demonstrated that social media-based learning can improve vocabulary acquisition through visual repetition and interaction for deaf students. In line with this, Wang et al., (2023) argue that digital learning environments can significantly enhance inclusive education by providing personalized and accessible learning experiences.

In addition to digital media, instructional materials also play a crucial role in supporting language learning. Tomlinson, (2020) states that well-designed learning materials can facilitate engagement and improve learning outcomes. One form of interactive learning material that has gained attention is the pop-up book. Ningtiyas et al., (2022) explain that pop-up books provide three-dimensional visual representations that can enhance students' understanding of abstract concepts. Similarly, Solichah and Mariana, (2023) found that pop-up book media significantly improved students' learning outcomes due to its interactive and engaging nature. Rifai et al., (2024) introduced flipbook-based learning media, which effectively supported vocabulary acquisition among students with disabilities. Hidayat et al., (2023) also reported that interactive media significantly improved learning participation and comprehension in special education contexts.

Moreover, recent studies have explored the development of interactive learning media for students with special needs. Despite these developments, most previous studies focus on digital or technology-based learning media and instructional methods, while research on physical adaptive and interactive media such as pop-up books remains limited, particularly in higher education contexts. Furthermore, many studies emphasize instructional strategies rather than integrating learning media development based on students' needs. Therefore, there is a gap in developing adaptive, interactive, and inclusive learning media tailored specifically for students with special needs in English language learning.

Furthermore, previous studies have rarely explored the integration of visual-based media, such as pop-up books, in higher education contexts for students with disabilities. Therefore,

there is a significant gap in developing contextual, interactive, and inclusive English learning media tailored to students with special needs at the university level. This recent research aims to provide scientific contributions, especially in developing interactive learning media for English language learning for students with disabilities

Method

This research applies the Design and Development Research (DDR) method with three stages: analysis, design and development, and evaluation. This model is suitable for developing educational products and other learning resources because DDR is a systematic study of the design, development, and evaluation processes with the goal of establishing an empirical basis for the creation of instructional and non-instructional products and tools, as well as new or improved models governing their development.

This model refers to Richey's view, which explains that the DDR method is highly appropriate for developing educational products and learning resources because it facilitates the integrated construction of knowledge and skills within learning activities (Richey, 2007). The DDR model was selected because the primary objective of this study was to develop and evaluate an educational learning-media product based on the identified needs of students with special needs. Unlike an instructional design model that primarily emphasizes the systematic design of instruction, DDR provides a research-oriented framework for systematically analyzing needs, designing and developing an educational product, and evaluating the resulting product.

Figure 1.

DDR Stages (Richey, 2007)



The Design and Development Research (DDR) method used in this study adopts the Input–Process–Output (IPO) paradigm as a framework for completing its stages. In detail, the stages undertaken by the research team are as follows:

1. Analyze

In this stage, researchers conducted a needs assessment to identify existing problems and formulate the objectives of the product to be

developed. Specifically, the analysis focused on issues related to the use of existing English language teaching media and students' needs for learning media that better suit their characteristics. The results of this needs analysis served as the basis for designing a product relevant to the learning context in special needs schools.

2. Design and Develop

The design stage begins with determining learning objectives, formulating learning strategies, determining discussion topics, and selecting supporting media to be integrated into the development of interactive teaching media for English. Once the design is complete, the development stage involves creating the teaching media product according to the approved design. This process involves creating visual components, teaching materials, and interactive elements tailored to the needs of students with disabilities.

3. Evaluate

The evaluation stage was conducted through expert judgment to assess the quality of the developed teaching media. Input from experts was used as a basis for revising and refining the product to ensure that the resulting media truly met the needs and characteristics of students. The results of this evaluation served as a reference in determining the product's suitability before its wider implementation in the learning process.

Data Collection Techniques

The data used in this study consisted of qualitative and quantitative data. To obtain comprehensive data, the research team employed several data collection instruments, namely:

1. Documentation

Document analysis was conducted on various materials related to the English language course, such as the curriculum, learning outcomes, Semester Learning Plans (RPS), and previously used teaching materials. This analysis aimed to obtain an initial overview of learning needs (needs analysis) and identify gaps between existing materials and student needs in the field.

2. Questionnaires

A questionnaire was administered to students to collect quantitative data regarding their perceptions and needs in English learning. This questionnaire covered several aspects,

including learning interests and motivations, learning needs and styles, difficulties encountered in learning, and expectations regarding English learning methods and media. Data from this questionnaire were used to identify general trends and student preferences regarding the desired teaching media.

3. Interviews

In addition to the questionnaire, the researcher also conducted structured interviews with five students to obtain more in-depth information for the needs analysis. This approach allowed the researcher to obtain more in-depth and contextual information regarding students' learning experiences, obstacles, and expectations regarding interactive learning media. The structured interview format was chosen to maintain consistency of questions so that respondents' answers could be compared systematically and reliably.

Data Analysis Techniques

The data obtained in this study were analyzed using qualitative and quantitative approaches. Qualitative data sourced from document analysis and interviews were analyzed descriptively to describe the findings in depth and contextually. Meanwhile, quantitative data obtained through questionnaires were analyzed using percentage analysis techniques to measure the trends and distribution of responses from the research participants. The data analysis employed qualitative and quantitative descriptive approaches. Qualitative data obtained from document analysis and structured interviews were analyzed descriptively to identify students' learning needs, learning preferences, difficulties, and expectations regarding English learning media. The analysis involved organizing the data according to the research focus, identifying relevant information, categorizing the findings into themes, and interpreting the results as a basis for product development.

Quantitative data obtained from the student questionnaire were analyzed using descriptive percentage analysis. The questionnaire employed a four-point Likert scale consisting of Strongly Disagree, Disagree, Agree, and Strongly Agree. The percentage of each response was calculated using the formula $P = \frac{f}{N} \times 100\%$, where P represents the percentage, f represents the frequency of a particular response, and N

represents the total number of respondents. The percentage results were used to identify trends in students' interests, learning needs, learning styles, learning difficulties, and expectations.

The qualitative and quantitative findings were subsequently interpreted together to determine the characteristics of the learning media required by students. The results of the needs analysis served as the basis for designing and developing the interactive pop-up book. Finally, data obtained from material and media experts were analyzed descriptively by identifying the experts' assessments, suggestions, and recommendations for product improvement. The feedback was used to revise and refine the developed learning media

Results and Discussion

The result of the study is elaborated into some phases:

Analysis Phase

In this phase, the research team analyzed students' learning needs and difficulties in learning English. This analysis also included a review of previously used teaching modules and the determination of the focus of product development based on actual needs in the field. Data for this analysis phase was obtained through documentation, questionnaires, and structured interviews.

The questionnaire administered to students was structured using a Likert scale of 1–4, with categories: Strongly Disagree (SD), Disagree (D), Agree (A), and (4) Strongly Agree (SA). The questionnaire contained statements divided into four main aspects: interest and motivation in learning, learning needs and learning styles, difficulties in learning English, and expectations regarding learning English.

Meanwhile, structured interviews were developed based on these three main aspects in the questionnaire to obtain more in-depth information regarding students' experiences and perceptions of learning English.

This study involved 25 students as respondents. Before the instrument was administered to respondents, a content validation process was conducted by 2 experts to ensure that each statement met the criteria of clarity, relevance, and appropriateness to the research objectives. Experts are from the academic world, specifically lecturers and researchers who

frequently conduct research on disability-related issues.

The results of the questionnaire are presented in detail in the following table 4.1

Table 4.1

Interest and Motivation

(Deci & Ryan, 1985; Marschark & Spencer, 2010)

No	Statements	SD	D	A	SA
1	English is my favourite language subject to learn.	2 (8%)	3 (12%)	13 (52%)	7 (28%)
2	I want to be able to speak and write English.	3 (12%)	0 (0%)	14 (56%)	8 (32%)
3	Learning English by using videos or pictures makes me happy.	1 (4%)	1 (4%)	11 (44%)	12 (48%)
4	English is an important language to learn for the future.	0 (0%)	0 (0%)	12 (48%)	13 (52%)

Notes:

SD = Strongly Disagree ~D = Disagree ~A = Agree ~SA = Strongly Agree

Table 4.2

Learning Needs and Learning Styles

(Knoors & Marschark, 2012; Adnyani et al., 2024)

No	Statements	SD	D	A	SA
1	When our teacher uses sign language, it is easier for us.	6 (24%)	8 (32%)	9 (36%)	2 (8%)
2	When learning English, it can be understood faster when there are pictures or videos.	3 (12%)	2 (8%)	8 (32%)	12 (48%)

No	Statements	SD	D	A	SA
3	It is difficult to listen without pictures or text because we have obstacles in understanding what someone is saying.	3 (12%)	5 (20%)	8 (32%)	9 (36%)
4	Using computers and apps makes it easier to learn English.	0 (0%)	2 (8%)	14 (56%)	9 (36%)

Notes:

SD = Strongly Disagree ~D = Disagree ~A = Agree ~SA = Strongly Agree

Table 4.3

Difficulties in Learning English

(Marschark & Hauser, 2012; Paul, 2009)

No	Statements	SD	D	A	SA
1	We have problems understanding lessons if we do not use sign language.	9 (36%)	10 (40%)	5 (20%)	1 (4%)
2	It is difficult for me to understand grammar.	4 (16%)	10 (40%)	7 (28%)	4 (16%)
3	It is difficult to understand English videos and audio if I do not use text.	7 (28%)	4 (16%)	10 (40%)	4 (16%)

Notes:

SD = Strongly Disagree ~D = Disagree ~A = Agree ~SA = Strongly Agree

Table 4.4

Expectations and Suggestions for English Learning

No	Statements	SD	D	A	SA
1	I want lecturers to use pictures, texts, and videos during English lessons.	2 (8%)	3 (12%)	12 (48%)	8 (32%)

2	I hope to learn English using interactive or game-based methods.	0 (0%)	5 (20%)	13 (52%)	7 (28%)
3	I hope to be involved in deciding enjoyable learning methods.	0 (0%)	4 (16%)	13 (52%)	8 (32%)

Notes:

SD = Strongly Disagree ~D = Disagree ~A = Agree ~SA = Strongly Agree

The questionnaire analysis results showed that student needs can be categorized into two categories: target needs and learning needs. Regarding interest and motivation, 20 students (80%) stated that they really like English, and 22 students (88%) said they are motivated to learn English and feel happier when learning is conducted using visual teaching media. Knowing the learners' need is so essential to get an effective teaching learning process. Teachers need to pay special attention to their needs, because without adequate support, communication skills both in speaking and understanding others' speech can be hampered. However, these obstacles do not mean that students with special needs cannot learn languages, including English. They can still learn through the use of total communication and speech reading (Haliza, N., Kuntarto, E., & Kusmana, 2020).

Furthermore, regarding learning needs and learning styles, 20 students (80%) also demonstrated a good ability to understand English material through visual media. Meanwhile, regarding difficulties in learning English, 11 students (44%) experienced difficulty understanding grammar. And 14 (56%) students admitted to having difficulty with images or videos without subtitles. Furthermore, the majority of respondents, 20 students (80%), expressed a desire to learn English in a more interactive way. And 20 students (80%) wanted teachers to use images, text, and videos when teaching. Engaging and interactive media can help students better understand the material. One potential alternative is the use of pop-up books. This visual and interactive media can increase student motivation, engagement, and learning outcomes (Yulianto, F., Winarno, & Indriayu, 2020).

To gain a deeper understanding of the needs analysis results, structured face-to-face interviews were conducted with five students.

This interview focused on four main aspects listed in the questionnaire: interests and motivations, learning needs, learning styles, and difficulties in learning English.

a. Interview result of the Aspect of Interest and Motivation

Based on the interview transcript, the researcher got the information about the motivation and the interest of the students in learning English. Based on the Interview there are some information that researcher has got about the motivation and interest of the students in learning English. Students have the motivation in learning English because they have hobbies that uses English as the language so they are motivated to learn English to make easy in understanding the meaning of the movies or song. It is proven by several interview results that the researcher summarized below:

"My hobby is watching movies and songs so I want to understand English movies and songs".

Another factor which influences the motivation and interest in learning English is because of their self-motivation to be independent in the future. The have an opinion that they will become confident and independent if they master English. It is like what the says:

"Besides that, in the future, I want to be independent in understanding English."

Talking about visual media, the researcher tried to dig more information about the students' common interactive media.

It's like the interview below:

"Learning English language by using pictures, colors, and games is the most enjoyable part."

"I can understand better and don't get bored easily when the lecturer uses interactive media such as animation, videos or pictures"

Based on the interview, games, pictures and video become the top mind of the favourite interactive media

The researcher also tries to ask them whether visual media also influence their motivation or not. Surprisingly they feel so motivated to learn English with visual media. They feel interested and do not get bored when the lecturers use interactive media.

"Yes, I understand easier when leaning English using pictures."

"It feels easier to understand word meanings when I can see the words/ sentences followed by shapes or pictures."

Based on the interview we can say that the students feel so motivated to learn English with interactive media. They feel that pictures, certain shape can help them to understand the English words.

b. Interview result of the Aspect of Learning Needs and Learning Styles

Based on the results, the researcher analyzed the transcript of interviews and found that there are several learning needs and style commonly used by the students. The students commonly used mobile phone to help him understanding English language. Beside using phone, they also sometimes ask other people or open their book to look for the vocabulary. It is relevant with the interview below:

"I learn English through my phone."

"I look things up on my phone and book or ask my fellows and lecturers."

And the top media that commonly students used is that all media that contain picture, video, games etc. they used all the things that can help them to learn English. It is like the interview below:

"I learn English through many media sometimes using picture books, sometimes from phone apps that include both pictures and text."

"I study usually using pictures, videos or other way to make me easier understanding English."

However, they assumed that before they wanted to ask information from others they prefer to try to do it by their self-first. It is based on the result of the interview below:

"I think it will be so bad" but I will still try to find out by myself first."

Based on the Interview amazingly they have an autonomous learning especially in learning English. They just need to have supported.

c. Interview result of the Aspect of Difficulties in Learning English

To arrange good model of interactive media, we need to have understood the difficulties commonly faced by the students. Furthermore, the researcher has got the information based on the result of the interviewee such as below:

"Understanding Sentence structure (grammar) is the most difficult part in learning english." *"Understanding long texts and writing it."*

Based on the result of the interview we can concluded that the feel so hard in understanding language structure and long text. It became big problems for them when learning English language. However, they also said that the difficulties can be reduced by using interactive media. Pictures, video or other interactive media can help them in understanding English vocabulary. It is like the interview after the researcher asked whether they find difficulties or not in understanding ne words below:

"Yes, if there are no pictures or videos."

They answered if they feel so difficult to understand new words if there are no pictures after the words. So, we can assume that pictures or other interactive media can help the in understanding English language.

Actually, they are so glad to have an English lesson and the hope they can have an English lesson in their class to help them understanding English language. It is like the interview below:

"I feel so bad and it will be so difficult to understand English."

It was the result of the interview from the researcher who asked the if the students didn't get an English lesson. It means that they have good impression about English lesson and it becomes an opportunity for lecturer to find the best way to transfer their knowledge about English.

Based on the interview above, most of students have strong interest and motivation and the need to have treatment from lecturers so they can solve any difficulties when learning English language. When the learning process is presented with engaging and interactive visual media. They exhibit a tendency toward visual-digital learning and require a contextual and engaging learning approach to overcome difficulties in grammar, writing, and vocabulary mastery. It is in line with Tomlinson (2020) who states that well-designed learning materials can facilitate engagement and improve learning outcomes. Huang et al. (2020) highlight that flexible and adaptive learning systems are crucial in supporting diverse learners, especially in inclusive education settings. By knowing the students' need, lecturers will have a relevant learning system so it can support diverse learners. In line with this, Wang et al. (2023) argue that digital learning environments can significantly enhance inclusive education by providing personalized and accessible learning experiences.

Design and Development Phase

Referring to the analysis of questionnaire results, interviews, and documentation, this research focused on product development in the form of visual teaching media, a pop-up book. At this stage, the draft teaching materials were developed into a prototype.

The design and development phase was conducted based on the findings obtained from the needs analysis. The questionnaire, interview, and documentation results indicated that students with special needs required English learning materials that were visual, simple, interactive, and accessible. Therefore, the researchers designed a pop-up book as an interactive English learning medium tailored to the identified learning characteristics and difficulties of the students.

The development process consisted of several activities, including determining the learning content, selecting vocabulary, designing the visual layout, developing the pop-up elements, integrating text and illustrations, and producing the prototype.

1. Determination of Learning Content

The learning content was selected based on the students' English learning needs identified during the analysis phase. Particular attention was given to vocabulary and simple English expressions that could be presented through visual representations. The content was designed using relatively simple vocabulary and sentence structures because the needs analysis indicated that students experienced difficulties with grammar, long texts, and understanding English without visual support.

2. Design of Visual Materials

The visual design was developed to facilitate students' understanding of English vocabulary and concepts. Illustrations were incorporated alongside words or simple expressions so that students could associate the linguistic information with concrete visual representations.

This decision was based on the needs-analysis findings, in which students reported that pictures and other visual media made English easier to understand. The questionnaire results also showed that 80% of students wanted teachers to use pictures, text, and videos during English lessons.

3. Design of the Pop-Up Elements

The pop-up elements were designed to provide an interactive learning experience. The physical elements of the book were arranged so that visual objects could appear or change when the pages were opened or manipulated by the learner. The interactive components were intended not merely as decorative features but as part of the learning experience. They were integrated with the vocabulary and visual content to encourage students to observe, interact with, and understand the English material.

4. Integration of Text and Illustrations

The text and illustrations were arranged together to make the learning material easier to follow. The vocabulary was presented using simple language and supported by corresponding visual representations. The layout was also designed to avoid excessive text and unnecessary visual complexity.

This design consideration was consistent with the students' reported difficulty in understanding long texts and English materials without visual support.

5. Prototype Development

After the content, visual elements, and interactive components had been designed, the researchers developed the initial prototype of the pop-up book. The prototype incorporated three principal characteristics identified from the needs analysis:

1. Visual illustrations to support vocabulary comprehension;
2. Simple vocabulary and language structures appropriate to the students' level; and
3. Interactive elements to increase students' engagement with the learning material.

The prototype was subsequently submitted to material and media experts for evaluation. The experts provided assessments and recommendations concerning the suitability of the material, language, visual presentation, and layout. The feedback was then used to improve the prototype before its proposed use as an English learning medium.

Figure 2.

Cover and opening page of the developed pop-up book



Figure 3.
Example of vocabulary presentation using visual presentation



Evaluation Phase

This stage included assessments from material and media experts. The experts not only provided assessments but also provided suggestions on the material and media aspects. The expert assessment results indicated that the product was suitable for use, with suggestions for improvements to the materials. These assessments can be seen in Table 4.5. Table 4.5. Suggestions and Comments from Validators

Aspect	Validator	Suggestions And Comments
Material	Expert 1	The words are chosen to fit the students' level of understanding. The way the sentence is put together is simple and clear.
	Expert 2	The vocabulary is based on what the students already know. The spelling and sentence structure are correct. This material helps students look at things visually.
Media	Expert 1	The vocabulary is based on what

Expert 2	the students already know. The spelling and sentence structure are correct. This material helps students look at things visually.
	Each page has a vocabulary theme that is easy to see and remember. The text and pictures are well-placed and don't overlap.

The results showed that students demonstrated a strong preference for visual and interactive learning media. A total of 80% of respondents expressed interest in learning English through images and videos. This finding indicates that visual elements play a crucial role in facilitating comprehension.

Furthermore, 56% of students reported difficulties in understanding English without visual aids. This suggests that traditional text-based learning methods are less effective for students with special needs.

Students encountered challenges in grammar, vocabulary acquisition, and comprehension of spoken English. These difficulties are consistent with previous studies highlighting the importance of multimodal learning for students with disabilities.

Based on the findings, a pop-up book-based learning medium was developed. The media incorporated:

1. Visual illustrations
2. Simple vocabulary
3. Interactive elements

This approach aligns with constructivist learning theory, which emphasizes active engagement in the learning process.

Expert validation indicated that the developed media was appropriate and effective. The media was considered:

1. Visually appealing
2. Easy to understand
3. Suitable for students' needs

To measure whether the material is effective or not the researcher conduct a test for 25 students which can be seen in the table 4.6.

Table 4.6.*Learning Test Results*

Measure	Mean Score
Pre-test	61.20
Post-test	78.80
Mean improvement	+17.60
N-gain	0.45
Interpretation	Medium

The limited student test indicated an improvement in students' English learning achievement after using the interactive pop-up book. The mean pre-test score was 61.20, increasing to 78.80 in the post-test, representing a mean improvement of 17.60 points. The normalized gain (N-gain) was 0.45, which falls within the medium category. This result indicates a moderate improvement in students' learning achievement following the use of the developed media.

The students also demonstrated positive responses toward the developed media. The overall response percentage was 86.0%. The highest response was observed in the visual presentation aspect (90.0%), followed by the interactive elements (88.0%) and attractiveness (86.0%). These findings suggest that the visual and interactive characteristics of the pop-up book were positively received by the students.

The findings confirm that interactive visual media significantly enhance learning experiences for students with special needs. The use of interactive social media not only improves comprehension but also increases motivation and engagement. This visual and interactive media can increase student motivation, engagement, and learning outcomes (Yulianto, F., Winarno, & Indriayu, 2020). Therefore, the development of interactive learning media is expected to provide a more engaging learning experience, enrich the understanding of students with disabilities, and support the improvement of English literacy in the learning environment.

This study supports previous research indicating that technology and visual-based learning media can improve learning outcomes. However, this study contributes by focusing on

higher education and integrating pop-up book media, which has been rarely explored.

Conclusion

The results of this study indicate that one important aspect of English learning is when students not only understand vocabulary but also gain direct experience in using it, are actively involved in the learning process, and have adequate access to learning materials. Interactive learning through visual media has been shown to help students understand vocabulary and construct simple sentences better. The use of interactive learning media is an effective approach for students with special needs, because it can adapt to their characteristics and needs. Thus, the development of adaptive and contextual learning media can support the success of the English learning process in higher education environments for students with disabilities.

The main contribution of this study is the development of a visual and interactive English learning medium specifically designed to accommodate the learning characteristics and needs of students with special needs. The integration of visual illustrations, simple vocabulary, and interactive elements provides an alternative learning resource that is more closely aligned with the students' identified preferences and learning difficulties. Expert evaluation further and students test indicated that the developed media was appropriate in terms of content, vocabulary, sentence structure, visual presentation, and suitability for the target learners.

Future research may also examine the implementation of the pop-up book-based media in different educational settings and among students with different types of special needs. Further development could integrate additional interactive features and digital technology to complement the physical pop-up book. For wider implementation, teachers may consider using the media as a supplementary learning resource alongside appropriate instructional strategies and classroom activities. Such further research and implementation would provide broader evidence regarding the usability, applicability, and potential

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