



ANALYSIS OF THE NEED FOR HYPERMEDIA E-MODULES IN DIFFERENTIATED SOCIAL STUDIES LEARNING: A CASE STUDY IN ELEMENTARY SCHOOL

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Abstract. Differentiated social studies learning is the right solution according to the learning needs of students, but there are still limited digital teaching modules that can meet the diverse needs of students in heterogeneous classrooms. This study aims to analyze the need for the development of hypermedia-based e-modules in Social Sciences (IPS) learning that applies a differentiated approach at the elementary school level. The method used is qualitative descriptive with a case study approach in several elementary schools in Indonesia. Data was collected through questionnaires, teacher and student interviews, and classroom observations to identify gaps between current learning conditions and actual needs in the field. The results of the analysis showed that teachers experienced obstacles in delivering social studies materials effectively to students with different abilities and learning styles. In addition, the available learning media has not been able to stimulate students' creative thinking skills optimally. Therefore, it is necessary to develop hypermedia e-modules that are interactive, adaptive, and able to support differentiation strategies and encourage students' creative thinking skills. These findings provide an empirical basis for designing digital learning modules that are contextual and responsive to the needs of the 21st century in primary schools.

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INTRODUCTION

The primary school education is an important foundation in producing quality human resources (Ferdhi Hasan et al., 2024; Shah et al., 2024). One of the subjects that plays a big role in the formation of students' character and social insight is Social Sciences (Astuti et al., 2025; Yılmaz & Çardak, 2025). Social studies learning aims to develop students' social knowledge, attitudes, and skills in understanding their social environment critically and contextually (Kuter & Sanal-Erginel, 2025; Navarro-Medina et al., 2025).

One of the big challenges teachers is to adjust the learning process according to the diversity of students in a class. A differentiated approach is a solution that can answer the needs of students more individually (Feiss et al., 2025; Roiha et al., 2025). The differentiation approach not only adjusts the learning content, but also the learning process and products according to the readiness, interest, and learning profile of student (Tomlinson & Jarvis, 2023; Tomlinson, 2014). However, the implementation of this strategy is still not optimal due to the limitations of flexible and adaptive learning media for these differentiations.

However, social studies learning in elementary schools is often still conventional (Astuti et al., 2025; Hasni et al., 2025). The learning approach used in social studies learning is less responsive to the diversity of student characteristics, both in terms of learning readiness, interests, and learning styles (Al-Kamzari & Alias, 2025; Mohamed et al., 2025). This condition has an impact on the low active participation of students and the lack of development of creative thinking skills as part of 21st century skills.

The differentiation approach is regarded the basis of qualified education, but differentiation is approach that is very difficult for teachers to apply (Kupers et al., 2024). The results of Rijal & Waluyo's (2025) research show that teachers have not been able to explore student characteristics in learning according to previous experiences and skills so that learning goals are not in accordance with students' interests, readiness, and profiles. Sianturi (2025) revealed that the significant obstacles faced by teachers in differentiated learning are limited resources, time constraints, and complexity in managing the abilities and moods of diverse students.

In the digital era, integrating technology in education is a demand as well as an opportunity. One of the relevant technological innovations is the development of hypermedia-based e-modules (Evenddy et al., 2024; Rahman et al., 2022). These digital modules present learning include in a variety of formats such as text, images, videos, audio, animations, and interactive links, which allow for personalization of learning and enrich the student learning experience (Mayer, 2024). With these characteristics, hypermedia e-modules are considered to be able to support the implementation of differentiated approaches and develop students' creative thinking skills more optimally.

However, to ensure that the development of this media truly answers real needs in the field, a systematic analysis of needs is needed. This study is important to understand the context of use, learning gaps, infrastructure readiness, and user preferences (teachers and students). So far, a comprehensive study that specifically analyzes the need for the development of hypermedia e-modules in the context of differentiated social studies learning at the elementary school level in Indonesia is still very limited. Therefore, this research is crucial as a first step towards developing more effective and contextual technology-based educational solutions.

Based on the description above, the formulation of the problem in this study is: *What is the need for the development of hypermedia e-modules in supporting differentiated social studies learning in elementary schools to improve students' creative thinking skills?* To answer this question, the approach used in this study is a descriptive qualitative approach with a case study method. Data were obtained through questionnaires, structured interviews, and observations to explore differentiated learning practices, media use, and the need for the development of hypermedia-based e-modules. The results of this needs analysis will be the basis for designing a prototype of an e-module that is appropriate to the context, curriculum, and characteristics of students at the elementary level.

The previous studies have shown the importance of integrating technology in social studies learning in primary schools. Rochmattulloh et al. (2022) proving that valid and reliable hypermedia-based learning tools can significantly promote learning outcomes. Haryanti et al. (2025) emphasizing the need for teachers for interactive PjBL-based e-modules and encouraging collaboration, Oktaviyanti et al. (2022) that character-based e-modules are effective in helping the understanding of the material as well as strengthening students' character. Kioko et al. (2025) reinforcing that hypermedia integration has a positive impact on academic achievement, while Ajlouni (2021) adding that the combination of robotic and hypermedia technology improves students' understanding of science concepts and learning motivation. The research Wiyanarti et al. (2024) expanding the context by showing that digital e-modules based on local wisdom are able to improve the pedagogic competence of social studies teachers. Meanwhile, Burak & Gultekin (2024) emphasizing that *an adaptive learning environment* that is tailored to the characteristics of students in increasing learning engagement and effectiveness.

This research shows that there is a trend of increasing the use of interactive media in learning, but not many have explicitly integrated the principle of differentiation in the design of e-modules, especially for social studies learning at the elementary school level. The novelty of this research lies in the combination of needs analysis with the design of hypermedia E-modules that support holistically differentiated learning to increase students' creative thinking.

Based on the background, problem formulation, solution approach, and urgency of developing learning media that is relevant to the needs of students, the purpose of this study is



to analyze the need for hypermedia-based E-modules in Social Science learning that apply a differentiated approach in elementary schools. This analysis includes the identification of heterogeneous classroom learning challenges, teacher and student expectations of media features that support differentiation, and the potential use of technology to enhance students' creative thinking skills. The findings of this study are expected to be an empirical basis in designing E-modules that are contextual, innovative, and oriented towards strengthening the quality of social studies learning at the basic level.

RESEARCH METHODS

This study uses a descriptive qualitative approach with a case study method. This approach was chosen to explore in depth the factual conditions in the field, especially in the context of the implementation of heterogeneous social studies learning in elementary schools and the need for the development of technology-based learning E-modules. The case study allows researchers to understand the phenomenon in a specific context, namely the need for the development of hypermedia e-modules in differentiated learning.

The research subjects consisted of 53 social studies teachers involved in filling out questionnaires, 10 teachers interviewed and 100 students in grades IV to VI from several elementary schools in SDN KWL, SDN CGS, SDN RJ in Majalengka regency who were selected purposively. School selection criteria include the diversity of student backgrounds, readiness to use technology, and teachers' openness to learning innovation. This approach is expected to provide a representative picture of the needs and challenges in the development of hypermedia-based learning media in classrooms that apply differentiation.

The data collection technique was carried out through three main instruments: (1) closed questionnaire, (2) structured interviews, and (3) classroom observation. A closed questionnaire based on the Likert scale for teachers, to measure teachers' perception of differentiated learning, media use, and the need for hypermedia-based e-module development. For more details on the Likert scale-based closed questionnaire, be seen Table 1.

Table 1. Likert Scale-Based Closed Questionnaire

No	Aspects	Indicator	Question	Item
1	Differentiated Learning	1.1 Implementation of content differentiation	I often modify social studies materials according to the student's ability level	1
		1.2 Process differentiation	I provide a variety of learning activities according to students' learning styles	2
		1.3 Product differentiation	I give students the choice of final project form	3
		1.4 Implementation constraints	I have difficulty implementing differentiated learning	4
2	Use of Learning Media	2.1 Media used	I often use digital media in social studies learning	5
		2.2 Media interactivity	The learning media I use is already interactive and interesting	6
		2.3 Infrastructure support	Our school has sufficient ICT facilities for the use of e-modules	7
3	E-Module Development Needs	3.1 Interest in hypermedia E-modules	I am interested in using e-modules that are equipped with videos, audio, and interactive quizzes.	8
		3.2 Expectations for E-module features	I hope that the social studies e-module can adapt to the needs of individual students	9
		3.3 Curriculum fit	I hope that the e-module is in accordance with the learning outcomes of the Social Studies Independent Curriculum	10

**Scale: 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree*

Structured interviews with teachers and students to dig deeper into contextual information. The interview with the teacher aims to explore the teacher's understanding of



differentiated learning, experience using digital media, and expectations for hypermedia e-modules. The interview with teachers aims to find out students' perceptions and expectations for social studies learning and the use of digital media. For more details on structured interviews, be seen Table 2.

Table 2. Structured Interviews

No	Questions to Teachers	Questions to Students
1	What are the challenges that you face in teaching social studies to students with diverse abilities?	What are the challenges in social studies learning?
2	How do you usually adjust the material and teaching methods to suit the needs of students?	What media does your teacher usually use in teaching social studies?
3	Have you ever used e-modules or other technology-based media in social studies learning? Tell us about your experience	Have you ever used media such as videos, animations, or interactive quizzes? How do you feel when you study with that medium?
4	According to you, what is the ideal learning medium to help students think more creatively in learning social studies?	If you could choose, what kind of media would you like to use to study Social Studies??
5	What features do you consider important to include in hypermedia-based social studies e-modules?	What makes you more enthusiastic and creative when studying social studies?

Classroom observations, to document the implementation of social studies learning and students' responses to the approaches used. The data is also supported by a study of curriculum documentation and relevant teaching tools. For more details of class observation, be seen Table 3.

Table 3. Class Observation

No	Aspects observed	Indicator	Information
1	Learning differentiation	Teachers modify content, processes, or products according to students' needs	Yes / No & Notes
2	Use of learning media	Teachers use technology-based media or interactive visuals	Yes / No & Notes
3	Student engagement	Students demonstrate active involvement during the learning process	Low / Medium / High
4	Student response to the Hypermedia E-module	Students seem interested in and interacting with the Hypermedia E-module	Low / Medium / High
5	Learning barriers	There are technical or pedagogical obstacles in the implementation of learning	Yes / No & Notes

The research instrument is developed based on indicators obtained from the study of relevant theories and references, such as differentiated learning (Tomlinson, 2014), Development of Hypermedia E-modules (Mayer, 2024; Branch, 2009), and students' creative thinking skills (Kenett, 2024; Kaufman & Glăveanu, 2025; Zhang et al., 2025). Before use, the instrument is validated by experts in the field of basic education and learning technology to ensure the validity of the content. Experts were asked to assess the following aspects: 1) the relevance of each item to the indicators being measured; 2) editorial and language clarity, and 3) the feasibility of the instrument used in the research of the need analysis of the development needs of Hypermedia E-modules. Each item was scored 1 (non-conforming) to 4 (very conforming), and was analyzed using Aiken's formula V. The results of the analysis showed that all the items obtained a V value > 0.80 , which means that they have a high degree of validity.

The data analysis technique in this study follows the interactive model from Miles & Huberman (1994), which includes three stages: (1) data reduction, by filtering relevant data from the results of questionnaires, interviews, and observations; (2) presentation of data, in the form of thematic and narrative descriptive matrices; and (3) conclusion and verification, to obtain findings related to the need for contextual and applicable hypermedia e-module development. The validity of the data is maintained through source and method triangulation techniques, as well as member checking to the main respondents.



Data Analysis Rubric on the results of the questionnaire, a recapitulation of the score for each indicator is carried out. Interpretation is carried out by grouping the average scores can be seen in Table 4.

Table 4. Interpretation of Questionnaire Results

Average Score Range	Interpretasi
1,00 – 1,80	Very Unsuitable
1,81 – 2,60	Low
2,61 – 3,40	Quite
3,41 – 4,20	High
4,21 – 5,00	Very High

The analysis of structured interview results was analyzed using a thematic approach. The thematic approach in this study cited by Mwita & Mwilongo (2025) and Clarke & Braun (2017) includes: 1) familiarization with the data, i.e. the researcher reads the interview transcript so as to understand the data collected; 2) initial coding is used to mark the parts of the data that need to be noticed and analyzed further; 3) a search for themes is used to formulate findings from the results of the analysis.; 4) a theme review is carried out to check the consistency and relevance of the theme that has been created with the existing data; 5) Theme definitions and naming are used to provide a clear and concise description for each theme; 6) The preparation of the report presents the research findings in a clearly and completely structured format regarding the relevant findings. For more details, be seen Figure 1.



Figure 1. Thematic Approach Steps

The analysis of the observation results was carried out descriptively according to the observation results based on social studies learning activities carried out by teachers related to the implementation of differentiation in learning, media use, student involvement in learning, student response, and learning obstacles carried out by teachers.

RESULTS AND DISCUSSION

This study aims to analyze the need for hypermedia-based E-modules in Social Science learning that applies a differentiated approach in elementary schools. The results of the study can be described as follows.

First, Differentiated Social Studies Learning based on the results of questionnaires, interviews and observations. The results of the questionnaire can be seen in Figure 2.

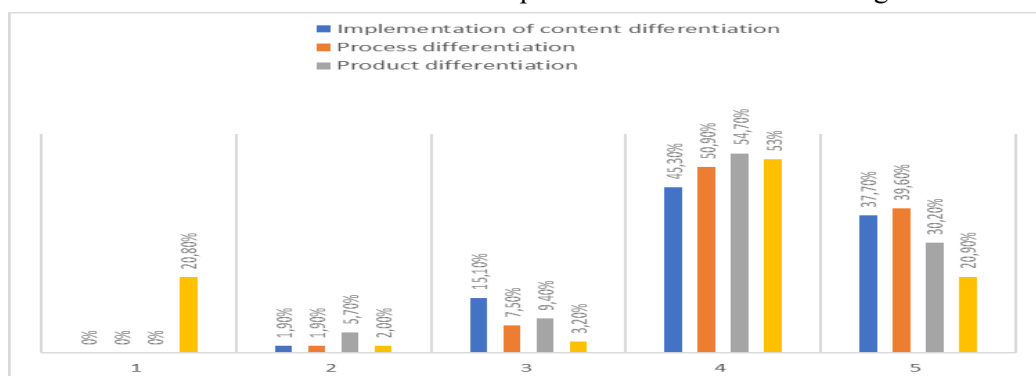


Figure 2. Differentiated Learning Questionnaire Results

The results of the questionnaire analysis in Figure 2 above show that the majority of teachers (45.3%) strongly agree with modifying the learning content to adjust to students' abilities. This shows that the practice of teacher-supported content differentiation is applied in

elementary schools. 50.9% of teachers agreed and 39.6% strongly agreed with the implementation of process differentiation in social studies learning. This shows that many teachers focus on teaching methods that suit students' learning styles and abilities. Most teachers also agree (54.7%) and strongly agree (30.2%) implement product differentiation to allow students to express their understanding in a more flexible way. The biggest obstacle in the implementation of differentiation is found in the category of implementation constraints. As many as 53% agreed and 20.9% strongly agreed that teachers felt that they faced obstacles in differentiated social studies learning.

The results of interviews with 10 teachers stated that "The biggest challenge is connecting the material we teach with the real lives of students. Often students feel that material such as history and geography content has nothing to do with their lives, so I have to be creative so that they can be more interested [3 teachers: RH, AY, SN]". "Teachers face difficulties in differentiating material for students with very diverse abilities. Some understand quickly, some are slow. At one time, teachers must adjust the teaching so that all students can follow the lesson well [2 teachers: AN, SW]". "Teachers find obstacles to the limitations of the media. In schools, access to use video or other technological tools is severely limited. This has an impact on conveying material that is quite difficult, such as concepts in geography or history [1 teacher: MA]". "Teachers experience obstacles where students often have difficulty understanding abstract concepts in social studies [1 teacher: OS]". "Teachers also feel that limited time is a big obstacle. In limited class hours, teachers struggle to cover all the topics that need to be taught in depth [2 teachers: HN, MS]". "Teachers have difficulty in managing time to ensure that students play an active role in group discussions [1 teacher: KS]".

The results of interviews with 20 students stated that "Students love social studies lessons, but sometimes I feel bored when I just read textbooks. Students want to have pictures or videos so that they can more easily understand [5 students: STJ, BRN, SMC, MWA, GTU]". "Students love to learn history, but the material that doesn't fit from my life sometimes feels boring. Why do I have to learn about historical figures who no longer exist [3 students: HN, SW, KL]". "Students like exciting social studies lessons, but sometimes it is difficult because there are many numbers and names that have to be memorized, such as important years or country names [6 students: TY, AJK, BME, SKP, PKA, WT]". "Students find it difficult to understand social change so they want to see real examples or videos that can explain more clearly [2 students: SR, FJ]". "Students love to learn about culture and social issues, but prefer it if there are direct examples and more interaction than just listening to the teacher talk [4 students: AUR, RHK, KKS, ETP]".

The results of observations conducted on April 7-11, 2025 in grades IV and V at SDN KWL, SDN CGS, SDN RJ in Majalengka regency on social studies materials show that teachers use lecture methods and group discussions in learning. The teacher delivered the material using textbooks and whiteboards. It can be seen that some students seem less interested and lose focus during the lecture. Students are more interested in group discussion activities, but some students find it difficult to collaborate without clear guidance from the teacher. The teacher is not seen using digital media to explain the material, causing some students to have difficulty understanding abstract material.

The results of observations conducted on April 14-16, 2025 in grade VI at SDN KWL, SDN CGS, SDN RJ in Majalengka regency on social studies materials show that learning uses whiteboards and verbal explanations by teachers. The teacher draws a map of the world and shows the location of the countries. Some students seem to have difficulty following explanations without more interesting visualizations. They have difficulty understanding the location of the country just from the map drawings. Many students seem to be less interested in this material due to the lack of interactive elements. They prefer a more visual or practical approach.

Based on the results of questionnaires, interviews, and observations that Differentiated Social Studies Learning based on the results of questionnaires, interviews and observations is needed to integrate technology in learning, social studies learning must be more connected with



students' direct experiences and daily lives, teachers need to differentiate in social studies learning.

Second, the use of learning media in social studies learning is differentiated based on the results of questionnaires, interviews and observations. The results of the questionnaire can be seen in Figure 3.

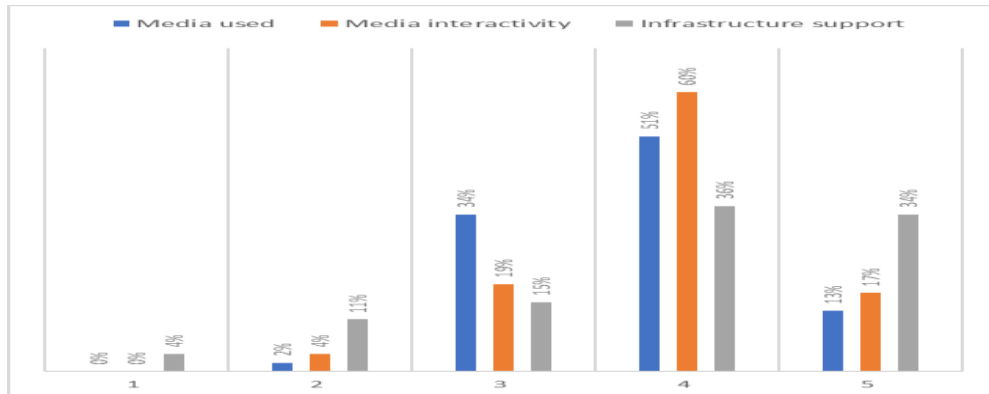


Figure 3. Lifting Results of the Use of Learning Media

The results of the questionnaire analysis in Figure 3 above show that the majority of teachers (51%) assessed that the media used was at the 4th level (agreed), followed by a score of 3 (neutral) as much as 34%. This shows that teachers agree that the use of digital media supports differentiated social studies learning. Media interactivity was considered very positive by teachers, with the highest score in category 4 (agree) as much as 60%, and 17% even gave a very agreeable score. This shows that interactivity in differentiated social studies learning media is needed media that is presented interactively and attractively to support student involvement in learning. Infrastructure support is considered by teachers to agree (36%), with 34% strongly agreeing that schools need to have ICT facilities to support the use of E-modules in differentiated social studies learning. This is still a challenge, as can be seen from the distribution of low responses.

The results of interviews with 10 teachers stated that teachers adjusted the materials and methods to suit the needs of students supported by learning media. "Teachers need to use animated image and video media because elementary school age students are easier to understand the material with audio-visual. If there are students who have difficulty reading, this media is very helpful for them to follow social studies lessons [1 Teacher: RH]". "Teachers in teaching social studies can use documentary video media about the conditions of the environment around students so that it is interesting for students and helps students who have difficulties in reading [3 Teachers: AY, SN, AN]". "Teachers in social studies material on geography can use mini globes or google earth so that students can understand the material more easily [2 Teachers: SW, MA]". "Teachers in learning need to be supported by the use of technology such as digital quizzes through Wordwall, Khoot, Quizziz so that students are not bored and help maintain focus and make it easier to map students' understanding of the material [4 Teachers: OS, HN, MS, KS]". "Teachers in social studies learning so that students have the ability to think creatively by giving project assignments in accordance with the Characteristics of students.

The results of interviews with 20 students related to the use of social studies learning media that are often used by teachers that 14 students [STJ, BRN, SMC, MWA, GTU, HN, SW, KL, TY, AJK, BME, SKP, PKA, WT] stated that they used conventional media such as package books, whiteboards and maps. Teachers use digital media videos, powerpoints in social studies learning [4 students: SR, FJ, AUR, RHK]. Meanwhile, 2 students [KKS, ETP] stated that teachers sometimes use interactive media such as songs, quizzes, and concrete objects in learning social studies materials on the diversity of cultures in my area. This is why the majority of students say that their teachers use conventional media in differentiated social studies learning. A small percentage [6 students: SR, FJ, AUR, RHK, KKS, ETP] stated that they had

used digital media and interactive media while most [14 students: STJ, BRN, SMC, MWA, GTU, HN, SW, KL, TY, AJK, BME, SKP, PKA, WT] had never used social studies learning using digital-based media. The responses of 20 students to the use of videos, animations or interactive quizzes showed pleasant emotional reactions using words such as: "better understanding of social studies material" [3 students: STJ, BRN, SMC], "more exciting social studies learning" [2 students: MWA, GTU], "learning is not boring" [6 students: HN, SW, KL, TY, AJK, BME], "faster to understand social studies material" [3 students: SKP, PKA, WT], "make the spirit of learning social studies" [2 students: KKS, ETP], "interesting in learning social studies" [2 students: SR, FJ], and "learning while playing in social studies learning" [2 students: AUR, RHK]. Students also revealed that the use of interactive media in social studies learning can increase understanding as expressed by 4 students [BME, SKP, PKA, WT], increase students' interest and motivation to learn in social studies learning expressed by 6 students [SMC, MWA, GTU, RHK, KKS, ETP]. Students stated that using interactive media can reduce boredom and boredom when learning social studies [3 students: STJ, AUR, SW], as well as provide a memorable learning experience in social studies learning [7 students: BRN, KL, TY, AJK, SR, FJ, HN].

The results of observations of teachers and students conducted on April 7-11, 2025 in grades IV and V, and on April 14-16, 2025 in grade VI at SDN KWL, SDN CGS, SDN RJ in Majalengka regency on social studies materials show that the use of digital-based learning media is rarely used by teachers in learning. The teacher starts the learning by asking students direct questions about the surrounding economic activities, such as markets, farmers, and traders. The teacher delivered the material explained orally and written on the blackboard then divided the Student Worksheet (LKS). Most of the students look less enthusiastic. Some students appear sleepy or unfocused during the explanation. Few students actively ask or answer questions. Most simply take notes and complete tasks as instructed. Students with visual or kinesthetic learning styles seem to have difficulty understanding the material without the help of concrete media.

Based on the results of questionnaires, interviews, and observations, the use of Differentiated Social Studies Learning media can make it easier for teachers to deliver material. Social studies learning without using technology-based media tends to be less interesting and not able to meet the learning needs of students optimally. Teachers need to use digital media to make social studies learning more contextual, meaningful and inclusive. This is very important in answering the challenges of 21st century learning.

Third, the need for the development of Hypermedia E-Modules based on the results of questionnaires, interview and observations. The results of the questionnaire can be seen in Figure 4 below.

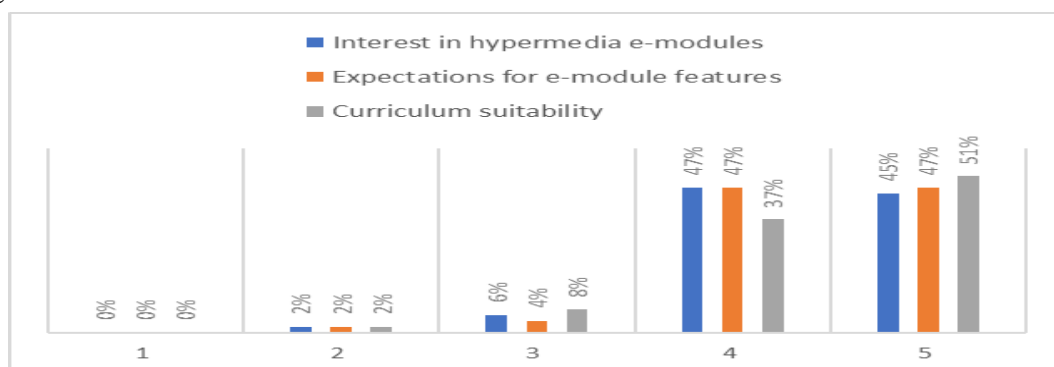


Figure 4. Results of Lifting the Development Needs of Hypermedia E-Modules

The results of the questionnaire analysis in Figure 4 above show that as many as 92% of teachers show a positive attitude (agree and strongly agree) towards the use of Hypermedia E-modules. This shows that the majority feel interested and willing to use these media in differentiated social studies learning. A total of 94% of teachers stated that they were in the category of agree and strongly agree, which means they have high expectations for the features



that will be provided in the E-module, such as interactivity, visualization, audio, and ease of use. As many as 88% of teachers stated that the Hypermedia E-module (agree and strongly agree) is adapted to the Merdeka curriculum. This shows that the use of Hypermedia E-modules is considered not only interesting, but also relevant and supports the expected learning outcomes in differentiated social studies learning.

The results of interviews with 10 teachers stated that 3 teachers [SN, AN, MS] revealed the features included in the Hypermedia E-module in social studies learning differentiated by using Multimedia content such as learning videos, interesting images, animations, and narrative audio so that students can understand abstract material such as history, culture, and regional maps. The teacher suggested that there should be an automatic quiz based on games, practice questions, and reflection so as to build students' independence and motivation in learning social studies [2 teachers: RH, SW]. The display is designed to be child-friendly and flexible so that it makes it easier for teachers and students to access the features in the Hypermedia E-module so as to attract students' interest in learning social studies learning [2 teachers: AY, KS]. Teachers want in the Hypermedia E-module a link using a barcode connected to YouTube, virtual museums, educational articles, and reflections so that students can explore information independently [4 teachers: MA, OS, HN, KS].

The results of interviews with 20 related students related to things that make students enthusiastic and creative in learning social studies through Hypermedia-based E-modules show that students are very enthusiastic about the use of interesting teaching media by displaying animated videos, historical films, songs, and color visuals [4 students: AUR, RHK, KKS, ETP]. Social studies learning activities supported by interactive quizzes and educational games made students challenged in learning but not burdened [6 students: STJ, BRN, SR, FJ, PKA, SMC]. Students play an active role in visual and artistic activities such as drawing, making posters and historical comics so as to encourage students' creativity independently [3 students: MWA, GTU, HN]. Students like projects such as making vlogs, maps, storytelling, mini museums and group presentations to encourage collaboration, exploration of various information, and confidence [7 students: SW, KL, TY, AJK, BME, SKP, WT].

The results of observations of teachers and students conducted on April 7-11, 2025 in grades IV and V, and on April 14-16, 2025 in grade VI at SDN KWL, SDN CGS, SDN RJ in Majalengka regency on social studies materials show that teachers' readiness in using the Hypermedia E-Module is mostly pedagogically ready, especially in directing students to use E-modules as an independent learning resource. Teachers who relate the material in the E-module to everyday life succeed in making students better understand and engage contextually. Teachers' digital literacy varies so that assistance is needed for teachers in the use of hypermedia features. Most of the student responses showed a high response, especially social studies learning presented by utilizing learning videos, animations, interactive quizzes, and interesting visualizations to make students more active in exploring information. Some students seem to be unfamiliar with the use of digital in social studies learning, so they need teacher guidance.

It is important to analyze the need for hypermedia e-modules in differentiated social studies learning in elementary schools so that they know the expectations of teachers and students. Students look more interested, active, and enthusiastic when interacting with multimedia content such as animated videos, interactive project activities, and digital quizzes (Adawiyah et al., 2020; Haryanti et al., 2025; Kioko et al., 2025; Rochmattulloh et al., 2022). These findings are consistent with the Theory of Cognitivism, which emphasizes that visualization and multimedia can improve attention and information processing (Liu & Cui, 2025), especially in elementary school-age students (Eutsler et al., 2020). This theoretical support is also strengthened by Mayer (2024) in the Cognitive Theory of Multimedia Learning (CTML) based on three basic assumptions: dual channels, limited capacity, and active processing. All three explained that students learn better when information is delivered through a combination of text, images, audio, and video, and that they are actively involved in the process of managing that information.



In the context of differentiation in learning styles, this theory strongly supports teachers' efforts to provide a variety of learning formats for visual, auditory, and kinesthetic students. The implementation of hypermedia-based E-modules is designed by considering the principle that CTML can respond to differences in students' learning readiness through features such as historical animated videos, interactive maps, reflective quizzes, and audio narration. This is in line with the view (Tomlinson, 2014; Tomlinson & Jarvis, 2023) that differentiated learning aims to tailor content, processes, and products to students' interests, readiness, and learning profiles.

The research by Susilawati et al (2025) shows that the development of social studies E-modules is designed to be tailored to the needs of students. Dermawan et al (2025) emphasized that interactive E-modules in the digital era can increase critical thinking, participation, and learning motivation of elementary school students. Nirmala & Puspita (2025) stated that the interactive E-module based on the FIVES (Facts, Ideas, Vocabulary, Explanation, Summary) model is suitable for differentiated learning because it presents multimodal content (text, video, interactive assignments) that supports literacy, numeracy, and active and reflective learning of elementary school students in Indonesia. Hasni et al (2025) that students find it easy to understand social studies material presented in multimodal content (video, audio, text), this can be adjusted to students' learning styles. Fransiska et al (2025) that the use of project-based flipbook E-modules strengthens the value of cooperation and creativity and supports the implementation of the Pancasila Student Profile Project (P5) in the Independent Curriculum.

Although the students' response was positive, there were technical and pedagogical obstacles experienced by teachers in digital-based learning. Technical obstacles experienced by teachers such as unstable internet access, device limitations, and time. Pedagogical obstacles can be seen from some students who are not familiar with the use of digital modules. Vygotsky's theory is particularly relevant in today's technology-based learning context. 21st century teachers must: (1) have creative learning design skills; (2) using technology to support scaffolding and build *cognitive harmony*; (3) Adopt a reflective and collaborative approach in creating a learning experience that encourages students' creativity (Daramola et al., 2024; Rigopouli et al., 2025). Teachers also need to have TPACK (Technological Pedagogical Content Knowledge) competencies in order to integrate digital media into the learning process effectively (Aldalah et al., 2025; Aslan et al., 2025; Azimkhan et al., 2025; Yani et al., 2025).

Observations also show that the role of teachers greatly determines the success of using E-modules. Teachers who are skilled and proactive in using digital media can guide students well, explain material through multimedia, and relate content to the context of students' lives. In line with the theory of Constructivism by Piaget and Bruner, which emphasizes that effective learning occurs if students are given the opportunity to build knowledge through hands-on experience and guidance from teachers (Al-Kamzari & Alias, 2025; Arega & Hunde, 2025; Yıldız, 2025).

Teachers have an important role in the successful implementation of the Hypermedia E-Module. Tang et al (2022), teachers who can manage digital learning creatively can increase students' creativity motivation. Teachers can also encourage the use of digital to improve student learning outcomes and engagement by increasing students' academic motivation (Li & Wang, 2024; Manurung et al., 2022; Nguyen et al., 2022). Teachers as facilitators are able to adapt teaching methods according to the needs of the 21st century in the Independent Curriculum (González-pérez & Ramírez-montoya, 2022; Isabirye et al., 2025; Zamora & Zamora, 2022).

CONCLUSIONS AND SUGGESTIONS

Based on the analysis of the needs of Hypermedia E-modules in differentiated social studies learning in elementary schools, it can be concluded that the use of Hypermedia E-modules is indispensable to support creative thinking skills through a more flexible differentiated learning approach and in accordance with the needs of each student. This e-module can facilitate more interactive, in-depth, and adaptive learning to various student



learning styles in accordance with the Independent Curriculum. In addition, hypermedia E-modules can increase student engagement by providing a more engaging learning experience and allowing them to learn according to their abilities. The main needs that need to be met in the development of this E-module include the provision of content that can be adjusted to the student's level of understanding, the integration of various media (text, images, video, and sound), as well as features that allow learning differentiation, such as interactive quizzes, project-based assignments, and feedback. The use of this technology also makes it easier for teachers to monitor individual student learning developments, while giving students the freedom to explore the material independently. Overall, the Hypermedia E-module is an effective tool in implementing differentiated social studies learning, enabling more inclusive learning and relevant to the needs of students in today's digital era.

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