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Students' Needs Analysis for Designing H5P-Based Interactive Videos Supporting Conceptual Understanding and Learning Motivation

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Abstrak

Penelitian ini bertujuan untuk menganalisis kebutuhan siswa sebagai dasar penyusunan spesifikasi desain pembelajaran dalam pengembangan video interaktif berbasis H5P untuk mendukung pemahaman konsep dan motivasi belajar pada pembelajaran ekonomi. Penelitian menggunakan pendekatan kuantitatif deskriptif melalui analisis kebutuhan terhadap 31 siswa kelas XI IPS di SMA Negeri 107 Jakarta. Data dikumpulkan menggunakan angket yang telah divalidasi oleh ahli dan dianalisis menggunakan statistik deskriptif berupa nilai rata-rata, standar deviasi, dan analisis peringkat. Hasil penelitian menunjukkan bahwa siswa membutuhkan pembelajaran yang didukung oleh penyajian materi secara sistematis, visualisasi konsep, contoh kontekstual, aktivitas interaktif yang disertai umpan balik langsung, serta fleksibilitas dalam mengakses materi sesuai dengan kebutuhan belajar. Temuan tersebut kemudian diterjemahkan menjadi spesifikasi desain pembelajaran yang meliputi pengorganisasian materi secara bertahap, integrasi aktivitas interaktif, penyediaan visualisasi konseptual, pemberian umpan balik langsung, dan dukungan terhadap pembelajaran mandiri. Penelitian ini menegaskan bahwa analisis kebutuhan tidak hanya berfungsi sebagai tahap awal pengembangan media, tetapi juga sebagai proses berbasis bukti yang mendukung pengambilan keputusan dalam desain pembelajaran pada bidang Teknologi Pendidikan.

Kata Kunci: *Analisis Kebutuhan; Video Interaktif; H5P; Pemahaman Konsep; Motivasi Belajar.*

Abstract

This study aimed to analyze students' needs as the empirical basis for developing instructional design specifications for H5P-based interactive videos to support conceptual understanding and learning motivation in economics education. A descriptive quantitative approach was employed through a needs analysis involving 31 Grade XI social science students at SMA Negeri 107 Jakarta. Data were collected using an expert-validated questionnaire and analyzed using descriptive statistics, including mean scores, standard deviations, and ranking analysis. The findings indicate that students require learning

experiences characterized by systematic content organization, conceptual visualization, contextual examples, interactive learning activities with immediate feedback, and flexible access to learning materials according to their learning needs. These findings were translated into instructional design specifications comprising sequential content organization, integrated interactive activities, conceptual visualizations, immediate feedback, and support for self-paced learning. The study demonstrates that needs analysis serves not only as a preliminary stage of media development but also as an evidence-based process that supports instructional design decisions in the field of Educational Technology.

Keywords: *Needs Analysis; Interactive Video; H5P; Conceptual Understanding; Learning Motivation.*

INTRODUCTION

In the context of school learning, economics is one of the essential subjects in the senior high school curriculum because it examines various phenomena closely related to everyday life, such as economic activities, markets, scarcity, human needs, and decision-making (Muijnck & Tieleman, 2025). Learning economics requires students not only to acquire theoretical knowledge but also to understand how economic concepts are interconnected and applied to real-world situations (Hasan et al., 2024). Therefore, conceptual understanding becomes a fundamental objective of economics education. In addition, students' learning motivation plays a crucial role because it influences their willingness to engage in learning activities, persist in solving learning problems, and maintain enthusiasm throughout the learning process (Wibowo et al., 2023).

These learning demands are closely related to the characteristics of senior high school students, who are generally in Piaget's formal operational stage. At this developmental stage, students are capable of abstract, logical, and analytical thinking, enabling them to analyze problems, understand relationships among concepts, and integrate information into meaningful knowledge (Piaget, 1972). Such cognitive abilities are particularly important in economics learning because the subject consists of numerous interconnected concepts that must be understood systematically before being applied to everyday contexts. At the same time, today's students are accustomed to obtaining information through digital media that are visual, easily accessible, and available for repeated learning whenever necessary (Szymkowiak et al., 2021).

These conditions indicate that learning media should not merely function as a channel for delivering information but should also facilitate meaningful learning experiences that accommodate students' cognitive characteristics and learning preferences. Appropriate learning media can help students understand complex concepts by presenting information in a more structured, concrete, and visually meaningful manner. According to the Cognitive Theory of Multimedia Learning, learning becomes more effective when verbal and visual information are integrated appropriately (Mayer, 2024). Furthermore, interactive learning environments can promote students' engagement while simultaneously encouraging independent learning (Bond & Bedenlier, 2019).

Among various digital learning media, interactive video has attracted considerable attention because it combines visual, auditory, and interactive elements within a single learning environment. Unlike conventional videos, interactive videos allow students to interact directly with learning content through embedded activities while receiving

information in a structured manner (Navarrete et al., 2025). This interaction enables students to participate actively during learning rather than merely watching instructional videos passively. In addition, interactive videos can be revisited repeatedly, allowing students to learn according to their own pace and learning needs (Sablić et al., 2021).

One platform that supports the development of interactive videos is H5P (HTML5 Package). H5P enables educators to integrate instructional materials with various interactive components, including quizzes, questions, immediate feedback, and navigation features within a single learning resource (Chandra et al., 2025). Through these features, students are encouraged to participate actively throughout the learning process instead of acting solely as information recipients. From a pedagogical perspective, these interactive features can enhance students' learning motivation by increasing engagement and participation during instruction (Bahar et al., 2025).

However, the effectiveness of H5P-based interactive videos depends not only on the technological features provided but also on how well the instructional design aligns with students' learning needs and characteristics. Consequently, the development of learning resources should begin with a systematic instructional design process. This perspective is consistent with the definition of Educational Technology proposed by the Association for Educational Communications and Technology (2023), which defines educational technology as the study and ethical practice of facilitating learning and improving performance through the creation, use, management, and evaluation of appropriate learning processes and resources. Accordingly, instructional design models commonly adopted in educational technology, including ADDIE, begin with an analysis phase that examines learners' needs, characteristics, and learning contexts before proceeding to design and development.

Previous studies have reported positive effects of interactive videos on students' conceptual understanding and learning motivation (Tugtekin & Dursun, 2022; Jacob & Centofanti, 2024; Ruf et al., 2023). Likewise, research investigating H5P has consistently reported that the platform is effective for developing valid, practical, and engaging learning media that improve students' participation and learning outcomes (Chandra et al., 2025; Bahar et al., 2025; Susanti et al., 2023). Nevertheless, most previous studies have primarily focused on product development, implementation, and effectiveness evaluation. In contrast, needs analysis has generally been treated only as a preliminary stage within development research and rarely reported as an independent research outcome capable of providing empirical evidence for determining instructional design specifications. Consequently, limited empirical information is available regarding students' needs that can systematically guide the development of H5P-based interactive videos in economics learning.

Addressing this gap, the present study focuses specifically on students' needs analysis as the primary research objective. The analysis encompasses five dimensions, namely economics learning experience, engagement and learning interest, learning media needs, independent and flexible learning needs, and experiences in understanding economic concepts. Rather than functioning solely as preliminary data for product development, the findings are intended to establish an empirical foundation for designing H5P-based interactive videos that correspond to students' characteristics and instructional needs.

Therefore, this study aims to analyze students' needs as the basis for designing H5P-based interactive videos to support conceptual understanding and learning motivation in economics education. The findings are expected to contribute not only to the development of learner-centered instructional media but also to strengthen the role of needs analysis as a strategic stage in educational technology research and instructional design.

METHOD

The study employed a descriptive quantitative approach using a needs analysis as the initial stage of Educational Design Research for the development of H5P-based interactive videos. In educational technology, needs analysis serves to identify learners' characteristics, learning needs, and instructional requirements that subsequently become the empirical basis for designing and developing learning products (Plomp & Nieveen, 2013). This approach is consistent with the analysis phase of instructional design, which emphasizes understanding learners and learning contexts before proceeding to the design and development stages (Sugiyono, 2022).

The participants consisted of 31 Grade XI social science students from SMA Negeri 107 Jakarta. Participants were selected using purposive sampling, with the following criteria: (1) actively enrolled in Grade XI social science classes, (2) willing to participate in the study, and (3) actively involved in economics learning. Since the purpose of this study was to identify the needs of prospective users as the foundation for product development, the selected sample was considered adequate to provide contextual information regarding learners' needs rather than to achieve statistical generalization (Plomp & Nieveen, 2013).

Data were collected using a needs analysis questionnaire developed based on theoretical perspectives concerning learning needs, learning motivation, conceptual understanding, and learning media. The instrument consisted of 24 statements distributed across five dimensions: (1) economics learning experience, (2) engagement and learning interest, (3) learning media needs, (4) independent and flexible learning needs, and (5) experiences in understanding economic concepts. The dimensions of the questionnaire are presented in Table 1. All questionnaire items employed a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree).

Table 1. Dimensions of the Student Needs Analysis Instrument

Aspects	Purpose
Economics Learning Experience	To identify students' experiences in participating in economics learning.
Engagement and Learning Interest	To identify students' motivation and engagement in learning economics.
Learning Media Needs	To identify students' needs for learning media in economics learning.
Independent and Flexible Learning Needs	To identify students' needs for independent and flexible learning opportunities.
Experience in Understanding Economic Concepts	To identify students' experiences and needs in understanding economic concepts.

The content validity of the instrument was evaluated by two experts. Based on the experts' recommendations, several revisions were made before the instrument was declared suitable for data collection. Instrument reliability was subsequently examined using Cronbach's alpha, yielding a coefficient of 0.79, indicating satisfactory internal consistency.

The questionnaire was administered online using Google Forms. Respondents completed the questionnaire by reporting their experiences during economics learning and expressing their perceptions regarding learning needs, conceptual understanding, learning motivation, and instructional media requirements.

The collected data were analyzed using descriptive statistics, including mean scores, standard deviations, and ranking analysis. Mean scores were used to identify the level of students' needs for each indicator, while standard deviations were calculated to determine the consistency of students' responses. Subsequently, all indicators were ranked according to their mean scores to determine the priority of students' needs. These findings were then translated into instructional design recommendations that served as the empirical basis for developing H5P-based interactive videos aligned with students' characteristics and learning needs.

RESULTS

Analysis of Economics Learning Experience

Table 2. Results of the Economics Learning Experience Needs Analysis

Rank	Indicator	Mean	Std.Deviation
1	Structured material delivery	4,29	0,739
1	The need for learning media	4,29	0,739
2	Active learning activities	4,23	0,560
3	The need for an easy-to-understand explanation	4,19	0,703

Based on Table 2, the indicators structured material delivery and the need for learning media obtained the highest mean score (M = 4.29), indicating that both aspects represent the primary learning needs of students in economics learning. The indicator active learning activities followed with a mean score of 4.23, while the need for easy-to-understand explanations obtained a mean score of 4.19.

Regarding response consistency, active learning activities showed the lowest standard deviation (SD = 0.560), whereas the remaining indicators ranged from 0.703 to 0.739, indicating relatively homogeneous responses among participants.

These findings suggest that students prioritize structured learning experiences supported by appropriate learning media and active learning activities. Accordingly, these needs were considered in formulating the preliminary design of the H5P-based interactive video.

Analysis of Engagement and Learning Interest

Table 3. Results of the Engagement and Learning Interest Needs Analysis

Rank	Indicator	Mean	Std.Deviation
1	Interest in interactive learning	4,35	0,755
2	Persistence in understanding of difficult material	4,16	0,735
2	Interest in learning economics	4,16	0,898
3	Active participation in learning	4,10	0,831
4	Ability to maintain focus	4,06	0,929

As presented in Table 3, interest in interactive learning obtained the highest mean score (M = 4.35), indicating that students highly value learning activities that allow active interaction with instructional content. The indicators diligence in understanding difficult material and interest in learning economics both obtained a mean score of 4.16, followed by active participation in learning (M = 4.10) and ability to maintain focus (M = 4.06).

The smallest standard deviation was found for diligence in understanding difficult material (SD = 0.735), while the remaining indicators ranged from 0.755 to 0.929, suggesting a relatively consistent pattern of responses.

Overall, the findings indicate that students prefer interactive learning experiences that encourage active participation and sustained engagement during economics instruction. These findings informed the design of interactive learning activities incorporated into the proposed H5P-based interactive video.

Analysis of Learning Media Needs

Table 4. Results of the Learning Media Needs Analysis

Rank	Indicator	Mean	Std.Deviation
1	Media for independent learning	4,26	0,815
2	Media to understand concepts	4,23	0,669
3	Interactive media	4,10	0,790
4	Material visualization	4,00	0,730
5	Additional media needs	3,94	0,998

Based on Table 4, media for independent learning achieved the highest mean score (M = 4.26), followed closely by media to understand concepts (M = 4.23). These findings indicate that students expect learning media to facilitate both independent learning and conceptual understanding. Other indicators, including interactive media, material visualization, and additional media needs, also received relatively high mean scores, ranging from 3.94 to 4.10.

The indicator media to understand concepts showed the lowest standard deviation (SD = 0.669), while the remaining indicators ranged from 0.730 to 0.998, reflecting relatively consistent responses across participants.

These findings indicate that learning media should provide conceptual support while enabling students to study independently according to their learning needs. Accordingly, these findings were used as one of the considerations in designing the H5P-based interactive video.

Analysis of Independent and Flexible Learning Needs

Table 5. Results of the Independent and Flexible Learning Needs Analysis

Rank	Indicator	Mean	Std.Deviation
1	Preparation for study before class	4,32	0,832
2	Learn at your own pace	4,29	0,529
3	Learning readiness	4,26	0,855
4	Benefits of self-study	4,10	1,106
5	Flexible learning access	4,03	0,875

As shown in Table 5, preparation for learning before class received the highest mean score (M = 4.32), followed by learning at one's own pace (M = 4.29) and learning readiness (M = 4.26). These results demonstrate that students expect learning resources that can be accessed before classroom instruction and that accommodate self-paced learning.

Among all indicators, learning at one's own pace showed the lowest standard deviation (SD = 0.529), whereas the remaining indicators ranged from 0.832 to 1.106, indicating relatively similar perceptions among respondents.

These findings highlight the importance of providing learning resources that support flexibility and learner autonomy. Consequently, flexibility became one of the primary design considerations in developing the H5P-based interactive video.

Analysis of Experiences in Understanding Economic Concepts

Table 6. Results of the Analysis of Students' Needs for Understanding Economic Concepts

Rank	Indicator	Mean	Std.Deviation
1	Visualization and concept illustration	4,52	0,677
2	Additional explanation needs	4,39	0,558
3	Gradual explanation of concepts	4,23	0,669
4	The relationship between economic concepts	4,16	0,779
5	Concepts in everyday life	3,97	0,795

According to Table 6, visualization and concept illustration obtained the highest mean score (M = 4.52), followed by additional explanation needs (M = 4.39). These findings indicate that students require learning materials supported by visual representations and supplementary explanations to facilitate conceptual understanding. The remaining indicators, including gradual explanation of concepts, relationships among economic concepts, and concepts in everyday life, also demonstrated relatively high levels of need.

The indicator additional explanation needs showed the lowest standard deviation (SD = 0.558), while the remaining indicators ranged from 0.669 to 0.795, indicating consistent perceptions among respondents.

Overall, the findings demonstrate that visual support and explanatory guidance constitute essential components of students' conceptual learning needs. These findings subsequently informed the instructional design of the H5P-based interactive video.

H5P-Based Interactive Video Design

Table 7. H5P-Based Interactive Video Design Based on the Needs Analysis

Aspects	Needs Analysis Findings	Design Strategy	Implementation
Economics Learning Experience	The material is presented in a structured manner	The material is arranged in stages in different learning sections.	The material is delivered sequentially and divided into several sub-materials.
	Need learning media	Combining various media to clarify the delivery of material	In the presentation of the material, relevant text, images, illustrations, and animations are used.
	Requires active learning activities	Incorporate interactive activities during learning	Certain sections have questions or quizzes that are accompanied by live feedback.
Engagement and Learning Interest	Requires interactive learning	Increase the level of student interaction during the learning process	Each relevant piece of material has an interactive activity.
	Requires an attractive presentation	Present information in an engaging and contextual way.	Visuals, animations, and examples of everyday life support the material.
Learning Media Needs	Need media for independent	Provide self-learning media	Videos can be re-studied by students at any time.

	learning		
	Need media that helps understand concepts	Utilize visualizations and illustrations to convey concepts.	Pictures, illustrations, and contextual examples are included in the presentation of ideas.
Independent and Flexible Learning	Learn at your own pace	Provides flexibility during the learning process	Students can stop, repeat, and continue learning as needed.
	Preparation for study before class	Support learning before class	Before the lesson, videos can be used as a learning resource.
Experience in Understanding Economic Concepts	Requires conceptual visualization	Utilize illustrations and visualizations to convey concepts.	Pictures, illustrations, and contextual examples are used to illustrate economic concepts.
	Needs additional explanation	Provide support to the concept.	Before students move on to the next material, each learning activity has an explanation or feedback.

The overall findings of the needs analysis were synthesized into a preliminary instructional design for the H5P-based interactive video. Each identified need was translated into specific design features, including systematic content organization, interactive learning activities, visual representations, contextual examples, immediate feedback, and flexible learning access.

As summarized in Table 7, the proposed instructional design aligns each dimension of students' needs with corresponding instructional strategies and implementation features. Thus, the resulting design provides an empirical foundation for developing H5P-based interactive videos that accommodate students' characteristics and learning needs in economics education.

DISCUSSION

Students' Needs for Learning that Supports Conceptual Understanding

The findings indicate that students require learning experiences that support conceptual understanding through systematic content organization, visual representations, contextual examples, and opportunities to revisit learning materials according to their individual learning needs. These findings suggest that students perceive the design and delivery of instructional experiences as important conditions for supporting conceptual understanding. Consequently, designing learning experiences that align with students' learning characteristics and needs is an important consideration for promoting meaningful conceptual learning.

The identified needs are consistent with the nature of economics as a discipline that contains abstract and interconnected concepts. Students are required to understand relationships among concepts before applying them to authentic situations (Hasan et al., 2024). When concepts are presented in an unstructured manner or rely primarily on verbal explanations, learners may experience difficulties in constructing coherent mental representations. Conversely, integrating verbal and visual representations can facilitate information organization and integration, thereby supporting conceptual understanding (Fiorella, 2023; Mayer, 2024). In this context, the findings indicate that students' needs extend

beyond access to learning media and include instructional experiences that deliberately support conceptual knowledge construction.

The present findings are consistent with previous studies indicating that economics learning requires students to understand relationships among concepts when explaining real-life economic phenomena (Hasan et al., 2024). Likewise, Mayer (2024) and Fiorella (2023) argued that integrating visual and verbal information can support learners in constructing richer mental representations. Previous studies have also reported positive effects of interactive video on conceptual understanding by presenting learning materials in structured and interactive formats (Hidayah et al., 2023; Irawan et al., 2025; Ruf et al., 2023). While these studies primarily evaluated interactive video after its development, the present study complements this body of research by showing that instructional characteristics commonly incorporated into interactive video are consistent with students' identified learning needs before product development begins.

From the perspective of Educational Technology, these findings reinforce the strategic role of needs analysis as a foundation for instructional design decision-making. Rather than functioning merely as a preliminary activity, needs analysis provides empirical evidence that can inform decisions regarding instructional strategies, learning resources, interaction patterns, and content presentation. Accordingly, the proposed instructional design is grounded not only in theoretical assumptions but also in learners' identified needs. This perspective is consistent with the AECT (2023) definition of Educational Technology, which emphasizes the systematic design of learning experiences through the appropriate use of learning processes and resources.

Students' Needs for Learning that Supports Learning Motivation

The findings also indicate that students expect economics learning to be interactive, engaging, and capable of encouraging active participation throughout the learning process. These preferences suggest that students perceive the quality of instructional experiences as an important condition for supporting their engagement and learning motivation. Consequently, instructional environments that actively involve students should be considered when designing learning experiences intended to sustain engagement and participation.

Students' preference for interactive learning highlights the value of opportunities to participate actively, respond to instructional activities, and receive immediate feedback as components of meaningful learning experiences. In contrast, instructional approaches dominated by one-way information delivery may provide fewer opportunities for active participation and engagement. These findings support the view that learning motivation develops through the interaction between learner characteristics and well-designed instructional environments that accommodate students' learning needs (Ryan & Deci, 2020).

These findings are consistent with Self-Determination Theory proposed by Ryan & Deci (2020), which emphasizes that learning environments capable of supporting learners' psychological needs can contribute to higher-quality motivation. Likewise, Bond & Bedenlier (2019) highlighted the importance of active learner engagement in creating meaningful educational experiences. Previous studies have also reported positive relationships between interactive learning environments and students' motivation, engagement, and learning interest (Amalia & Agustina, 2022; Dewi & Negara, 2021; Sa'adah et al., 2025; Wibowo et al., 2023). Extending these perspectives, the present study identifies interactivity, feedback, and engaging learning experiences as instructional priorities explicitly expressed by students and therefore relevant to consider during the design stage rather than only after implementation.

From an Educational Technology perspective, these findings emphasize that instructional design decisions should be informed by empirical evidence regarding learners' motivational needs. Data concerning students' preferences for interaction, feedback, contextual learning experiences, and learning flexibility provide valuable guidance for selecting instructional strategies and learning resources that can support learner engagement. Consequently, needs analysis serves as an evidence-based process that connects learner characteristics and identified needs with instructional design decisions, reflecting the Educational Technology perspective proposed by AECT (2023).

Implications for Educational Technology

This study contributes to the field of Educational Technology by illustrating how needs analysis can function as an evidence-based process for informing learner-centered instructional design. The identified needs, including systematic content organization, conceptual visualization, interactive learning activities, immediate feedback, and flexible learning opportunities, indicate that instructional design decisions should be grounded in learners' characteristics and identified needs rather than driven solely by available technological features. Accordingly, technology can function as a means of facilitating meaningful learning experiences rather than becoming the primary objective of instructional innovation.

The findings further support the Educational Technology perspective that instructional solutions can emerge from the systematic integration of theory, empirical evidence, and instructional practice. By translating students' identified needs into specific instructional design recommendations, this study illustrates how empirical data can guide decisions regarding instructional strategies, learning resources, interaction design, and content presentation. This process is consistent with instructional design principles emphasized within Educational Technology and illustrates the practical application of the analysis stage in Educational Design Research.

The principal contribution of this study lies in providing an evidence-based link between students' needs analysis and instructional design specifications for developing H5P-based interactive videos. Unlike previous studies that primarily focused on product development and effectiveness evaluation, this study illustrates how learners' identified needs can inform instructional design decisions before product development begins. Consequently, the findings strengthen the role of needs analysis as a strategic component of Educational Technology research while reinforcing the AECT (2023) perspective that effective learning experiences should be designed through the appropriate integration of learning processes and resources.

CONCLUSION

This study identified students' learning needs as an empirical basis for designing H5P-based interactive videos in economics education. The findings indicate that students require learning experiences characterized by systematic content organization, conceptual visualization, contextual examples, interactive learning activities accompanied by immediate feedback, and flexible access to learning materials. These identified needs were translated into proposed instructional design specifications for H5P-based interactive videos that align with students' characteristics and learning needs.

Beyond providing recommendations for interactive video development, this study highlights the strategic role of needs analysis within Educational Technology and instructional design. The findings illustrate how needs analysis can function not only as a preliminary stage

but also as an evidence-based process for informing instructional design decisions. By grounding design decisions in students' identified needs, needs analysis can help ensure that instructional innovations are relevant to learners' characteristics and learning contexts.

The study therefore provides an evidence-based starting point for the subsequent development and validation of H5P-based interactive videos. Future research should develop the proposed instructional design, evaluate its content and usability, and examine its effectiveness in supporting students' conceptual understanding and learning motivation. Such empirical evaluation is necessary to determine whether the identified needs and resulting design specifications translate into improved learning outcomes after implementation.

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