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Designing a Data-Driven E-Learning Module for Teaching English to Young Learners: Integrating Needs Analysis and the ISAV Learning Model

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ABSTRACT

This study designed a data-driven e-learning module for Teaching English to Young Learners by integrating needs analysis with the Interactive, Somatic, Auditory, and Visual learning model. Using a design-based research approach, the study focused on the analysis and design phases. Data were collected from elementary school English teachers and pre-service English teachers through a structured questionnaire addressing necessities, lacks, and wants. The findings identified vocabulary, reading, and oral communication as key learning necessities, alongside difficulties in sentence structure and broader instructional constraints. Respondents also preferred interactive and multimodal learning activities. These findings informed an ISAV-based e-learning module prototype integrating interactive, somatic, auditory, and visual features to support learner-centered, multimodal, and contextually responsive English instruction for young learners in digital environments.

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1. INTRODUCTION

Teaching English to Young Learners (TEYL) has become increasingly important in English as a Foreign Language (EFL) contexts, particularly as teachers are expected to respond to diverse learner characteristics and changing instructional practices [1]. Young learners differ in phonological awareness, vocabulary development, literacy-related subskills, and perceptual processing, which highlights the importance of developmentally appropriate and responsive instructional design [2-5]. Learner-related factors such as anxiety and learning preferences may also influence English learning outcomes [6]. Therefore, TEYL instruction can benefit from interactive and multimodal learning environments that combine visual, physical, auditory, and digital experiences to support learner engagement and conceptual understanding [7, 8]. However, many instructional materials for young learners still rely heavily on text-based activities and provide limited opportunities for interaction and multimodal engagement. Such materials may overlook differences in literacy development, learning pace, and modality preferences [3]. In addition, insufficient contextualization and inappropriate vocabulary organization may hinder vocabulary acquisition and increase cognitive load [9]. These limitations indicate the need for more adaptive, engaging, and learner-centered instructional materials.

Technology-enhanced learning offers opportunities to address these issues through flexible, interactive, and multimodal environments. E-learning modules can integrate visual, auditory, and interactive elements to support vocabulary learning, pronunciation, listening comprehension, and learner participation. Previous studies have shown that interactive digital learning environments can enhance engagement, feedback, and self-regulated learning [10-12]. Nevertheless, the value of e-learning depends on how its digital features are grounded in learner needs and pedagogical principles.

One relevant framework for designing multimodal e-learning materials is the ISAV learning model, which consists of Interactive, Somatic, Auditory, and Visual components. The model integrates learner interaction, bodily movement, auditory input, and visual representation to support holistic language learning. Its principles are consistent with embodied and multimodal learning theories, which emphasize sensory engagement, physical action, and multiple modes of representation [7, 13, 14]. However, the application of ISAV principles in data-driven e-learning module design for TEYL remains underexplored.

Needs analysis is also essential in instructional material development because it identifies learners' necessities, lacks, and wants. However, many studies treat needs analysis mainly as a diagnostic activity without clearly showing how its findings are translated into concrete e-learning design features. This creates a gap between empirical learner data and instructional design decisions. To address this gap, this study aims to design a data-driven e-learning module for TEYL by integrating needs analysis and the ISAV learning model. The study focuses on the analysis and design phases by mapping learners' necessities, lacks, and wants onto ISAV-based e-learning features.

2. LITERATURE REVIEW

Instructional design in TEYL should be aligned with learners' developmental, cognitive, affective, and perceptual characteristics. Young learners in EFL contexts differ in cognitive-linguistic readiness, phonological awareness, vocabulary development, and early literacy skills. These differences require instructional approaches that are sensitive to learners' processing capacities and developmental needs. Studies suggest that young learners benefit

from concrete and contextually embedded learning experiences supported by multimodal input, such as visuals, gestures, and auditory stimuli [3]. Affective factors, including motivation, anxiety, and engagement, also influence learning outcomes and highlight the need for emotionally supportive learning environments [6, 15].

Theoretically, language learning among young learners can be understood through socio-cognitive, multimodal, and embodied learning paradigms. Embodied cognition views learning as grounded in sensorimotor experience, where perception, action, and cognition are interconnected [16]. In TEYL, this perspective supports the use of movement, gestures, and action-based activities to connect language forms with meaning. Multimodal learning similarly emphasizes the integration of visual, auditory, and kinesthetic channels to enhance comprehension, retention, and engagement. These perspectives suggest that English instruction for young learners should provide multiple modes of representation and participation.

Needs analysis is a central framework in learner-centered instructional design. It identifies learners' necessities, lacks, and wants. Necessities refer to competencies required to achieve instructional goals; lacks indicate gaps between current abilities and target competencies; and wants represent learners' learning preferences. In TEYL contexts, necessities often include vocabulary, early literacy, and oral communication, while lacks may involve limited vocabulary, low confidence, insufficient exposure, and difficulties in understanding language structures [3]. Wants commonly include enjoyable and meaningful activities such as games, storytelling, songs, and interactive tasks [17]. Thus, needs analysis provides an empirical basis for designing relevant instructional materials. The ISAV learning model offers a structured framework for translating needs-based and multimodal principles into instructional design. The interactive component emphasizes participation and communication; the somatic component incorporates physical movement; the auditory component provides listening input and pronunciation practice; and the visual component uses images, videos, and other visual representations to support comprehension. The ISAV model is consistent with embodied and multimodal learning because it views learning as an integrated process involving interaction, movement, sound, and visual input [5, 14].

Empirical studies show that multimodal and embodied activities can support young learners' language development. Drama-based activities, storytelling, gestures, and action-based tasks can promote vocabulary development, engagement, and memory retention by providing contextualized and meaningful language experiences [7, 8, 17, 18]. These findings indicate that somatic and interactive elements can function as pedagogical strategies that help learners understand, remember, and use language more effectively.

Technology-enhanced learning environments provide opportunities to deliver multimodal instruction in flexible and structured ways. E-learning modules can integrate audio, images, videos, animations, interactive quizzes, and feedback within a single learning environment. These features may support learner engagement, self-regulated learning, and formative assessment [10, 11]. Authentic tasks and performance-based assessments can also enhance the relevance and transferability of learning outcomes [19, 20]. However, digital features need to be aligned with learners' needs and instructional goals to have pedagogical value.

Despite growing evidence supporting multimodal, embodied, and technology-enhanced learning, several gaps remain. Many studies focus on specific interventions, tools, or activities without offering a comprehensive framework that connects learner needs, multimodal

principles, and e-learning design. Moreover, the effectiveness of multimodal instruction may vary according to learner characteristics, perceptual preferences, and the ways in which learning activities are designed and implemented [14, 21]. Therefore, multimodal design should be understood as the systematic alignment of learner needs, objectives, strategies, and digital features, rather than the mere combination of media.

Another gap concerns the translation of needs analysis into e-learning design. Although needs analysis is widely recognized as a critical stage in instructional design, few studies explain how its findings become concrete design specifications, particularly in TEYL contexts. Similarly, while ISAV provides a promising framework for integrating interactive, somatic, auditory, and visual learning, its application in data-driven e-learning module design for young learners remains limited. Therefore, this study proposes a data-driven framework that maps learners' needs onto ISAV-aligned e-learning components as a basis for developing learner-centered digital materials for TEYL.

3. METHODS

This study employed a Design and Development Research (DDR) approach informed by the Design-Based Research (DBR) framework. Detailed information for this methodology is explained elsewhere [22]. This approach was selected because the study aimed to develop a theoretically grounded and contextually relevant instructional design rather than to evaluate the effectiveness of an implemented intervention. DBR is appropriate for this study because it connects practical educational problems, empirical data, theoretical principles, and instructional design solutions. The DBR framework consists of four phases: problem analysis, solution development, iterative testing and refinement, and reflection to generate design principles. As shown in **Figure 1**, this study focused only on the first two phases: analyzing learners' needs and developing an ISAV-based e-learning module prototype. The implementation, testing, and refinement phases were beyond the scope of this study and are suggested for future research.

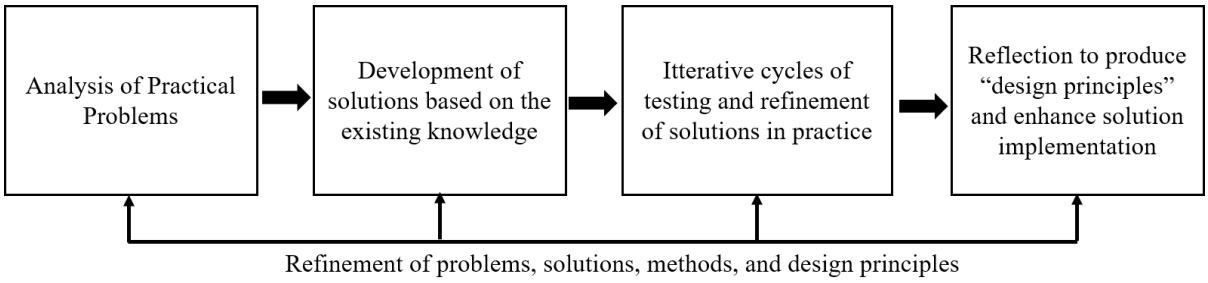


Figure 1. Design-based research model.

The study was conducted in the context of EFL instruction for young learners in Indonesia, involving both practicing elementary school English teachers and prospective English teachers. The participants consisted of 33 elementary school English teachers and 49 university students enrolled in English education programs. They were selected purposively because they were considered relevant to the development of TEYL instructional materials. The teachers provided classroom-based perspectives on learners' needs and instructional challenges, while the university students contributed perspectives as prospective English teachers. Combining these two groups allowed the study to obtain complementary insights into learners' necessities, lacks, and wants.

Data were collected using a structured Likert-scale questionnaire based on the needs analysis framework of necessities, lacks, and wants. The questionnaire explored participants' perceptions of essential learning needs, existing learning gaps, and preferred learning conditions in TEYL. The items covered aspects such as vocabulary development, reading comprehension, oral communication, sentence structure, learning activities, and instructional media. The questionnaire was developed by referring to literature on needs analysis, TEYL, multimodal learning, and e-learning design. It was distributed to both participant groups, and the responses were compiled for descriptive analysis.

The data were analyzed using descriptive statistics, including mean scores and percentage distributions, to identify dominant response tendencies. The results were then categorized into necessities, lacks, and wants. Necessities referred to competencies considered important for young learners, lacks referred to learning gaps or difficulties, and wants referred to preferred learning activities, media, and instructional conditions. The quantitative results were further interpreted to identify patterns related to learners' cognitive, affective, and perceptual needs. These interpretations were used as the basis for developing the e-learning module design.

The e-learning module was developed through a data-to-design mapping process. The needs analysis findings were translated into learning objectives, ISAV components, instructional activities, digital features, and formative assessment tasks. This process ensured that the module design was grounded in empirical data and aligned with learners' needs. The ISAV learning model served as the main pedagogical framework. Interactive elements were represented through quizzes, games, and communicative tasks; somatic elements through movement-based activities; auditory elements through listening input, pronunciation practice, and songs; and visual elements through pictures, flashcards, videos, and other visual materials. The final output was a structured prototype consisting of objectives, input materials, activities, practice tasks, and assessments.

This study was limited to the analysis and design phases of the DBR process. The developed e-learning module was not implemented or tested in classroom settings; therefore, this study does not claim its effectiveness in improving learners' English achievement, motivation, or engagement. The contribution of this study lies in providing a theoretically grounded and empirically informed design framework for an ISAV-based e-learning module in TEYL. Future research should involve expert validation, classroom implementation, iterative refinement, and evaluation of learning outcomes.

4. RESULTS AND DISCUSSION

4.1. Results of the Needs Analysis

The needs analysis was based on responses from 33 elementary school English teachers and 49 university students enrolled in a TEYL subject. The analysis was organized into three dimensions: necessities, lacks, and wants. Overall, the results show that both groups perceived vocabulary development, reading comprehension, and oral communication as important components of English learning for young learners, although their priorities differed slightly.

From the teachers' perspective, learners' necessities were strongly related to three basic competencies: vocabulary development, reading comprehension, and oral communication. As shown in **Table 1**, all three items obtained high mean scores. Q1 received the highest mean

score (M = 3.79), followed by Q2 (M = 3.67) and Q3 (M = 3.61). These results indicate that teachers considered these competencies essential for supporting young learners' early English development.

The relatively high mean scores in **Table 1** indicate that teachers consistently perceived the three necessity items as important. The total score of 11.06 further indicates that teachers generally assigned high ratings to the necessity items. The standard deviation values, which were relatively low, show that the teachers' responses were fairly consistent.

Table 1. Descriptive statistics of teachers' responses on learners' necessities.

ITEMS	N	MINIMUM	MAXIMUM	MEAN	STD. DEVIATION
Q1	33	1	4	3.79	0.600
Q2	33	2	4	3.67	0.540
Q3	33	2	4	3.61	0.556
TotalNecessities	33	8	12	11.06	1.171
Valid N (listwise)	33				

The university students showed a similar pattern. As presented in **Table 2**, Q2 received the highest mean score (M = 3.76), while Q1 and Q3 obtained equal mean scores (M = 3.57). This suggests that students also recognized the importance of the three core competencies, with slightly greater emphasis on the aspect represented by Q2. A comparison between **Table 1** and **Table 2** shows that both groups rated the necessity items highly. Teachers gave the highest score to Q1, whereas students gave the highest score to Q2. This difference suggests that teachers and pre-service teachers shared a general agreement on the importance of learners' necessities, but they differed slightly in the aspect they prioritized most.

Table 2. Descriptive statistics of students' responses on learners' necessities.

ITEMS	N	MINIMUM	MAXIMUM	MEAN	STD. DEVIATION
Q1	49	2	4	3.57	.540
Q2	49	2	4	3.76	.480
Q3	49	2	4	3.57	.540
TotalNecessities	49	9	12	10.90	1.065
Valid N (listwise)	49				

In relation to learners' lacks, teachers identified Q4 as the most prominent issue. As shown in **Table 3**, Q4 obtained the highest mean score (M = 3.36), followed by Q5 (M = 2.85) and Q6 (M = 2.09). This indicates that the aspect represented by Q4 was perceived as the most significant lack among young learners from the teachers' perspective. Teachers perceived learners' lack unevenly across the three items. Q4 was rated relatively high, indicating a stronger concern in that area. In contrast, Q6 received the lowest mean score, suggesting that teachers considered this aspect less prominent compared with the other lack items. The students' responses showed a different pattern.

As presented in **Table 4**, Q6 received the highest mean score (M = 3.41), followed by Q5 (M = 3.27) and Q4 (M = 3.02). This indicates that students perceived the aspect represented by Q6 as the most significant lack, while Q4 was rated lowest among the three lack items.

The comparison between **Tables 3** and **4** indicates a difference in emphasis between teachers and students. Teachers rated Q4 as the most significant lack, while students rated

Q6 as the highest. This suggests that the two groups viewed learners' difficulties from different perspectives. Teachers may have focused more on issues directly observed in classroom learning, while students may have given more attention to broader instructional or systemic factors.

Table 3. Descriptive statistics of teachers' perceptions of learners' lacks.

ITEMS	N	MINIMUM	MAXIMUM	MEAN	STD. DEVIATION
Q4	33	2	4	3.36	.653
Q5	33	1	4	2.85	.795
Q6	33	1	4	2.09	.980
TotalLack	33	4	12	8.30	1.912
Valid N (listwise)	33				

Table 4. Descriptive statistics of students' perceptions of learners' lacks.

ITEMS	N	MINIMUM	MAXIMUM	MEAN	STD. DEVIATION
Q4	49	2	4	3.02	0.559
Q5	49	1	4	3.27	0.811
Q6	49	2	4	3.41	0.574
TotalLack	49	5	12	9.69	1.517
Valid N (listwise)	49				

The final dimension concerns learners' wants. The data in **Table 5** show that teachers gave high ratings to all three want items. Q8 received the highest mean score (M = 3.82), followed by Q7 (M = 3.79) and Q9 (M = 3.36). These results indicate that teachers perceived learners' wants as strongly related to engaging and interactive learning experiences. Teachers perceived learners as having strong preferences for the learning conditions represented by Q7, Q8, and Q9. The total score of 10.97 indicates that the want items were generally rated highly. Among the three items, Q8 received the highest score, suggesting that this aspect should receive particular attention in the design of the e-learning module.

Table 5. Descriptive statistics of teachers' perceptions of learners' wants.

ITEMS	N	MINIMUM	MAXIMUM	MEAN	STD. DEVIATION	SKEWNESS	STD. ERROR
Q7	33	3	4	3.79	0.415	-1.476	0.409
Q8	33	3	4	3.82	0.392	-1.730	0.409
Q9	33	2	4	3.36	0.603	-0.346	0.409
TotalWants	33	9	12	10.97	1.015	-0.700	0.409
Valid N (listwise)	33						

Taken together, the needs analysis provides an empirical basis for the development of the proposed e-learning module. The necessity results indicate that the module should address core English competencies for young learners. The results concerning learners' lacks show that learners' difficulties were perceived differently by teachers and students, suggesting the need for a design that responds to both classroom-based and broader instructional concerns. The wants results indicate the importance of incorporating engaging, interactive, and learner-centered activities. These findings support the development of an ISAV-based e-learning module that integrates interactive, somatic, auditory, and visual learning features.

4.2. Development of The Proposed Instructional Model

Based on the results of the needs analysis, a data-driven instructional model was developed to address learners' identified necessities, lacks, and wants. The model is grounded in the ISAV (Interactive, Somatic, Auditory, Visual) learning framework, which integrates multiple learning modalities to support young learners' language development. The model translates empirical findings into instructional design components that are responsive to learners' characteristics and learning preferences. As illustrated in **Figure 2**, the ISAV learning model is embedded in the e-learning module through the integration of interactive, somatic, auditory, and visual elements.

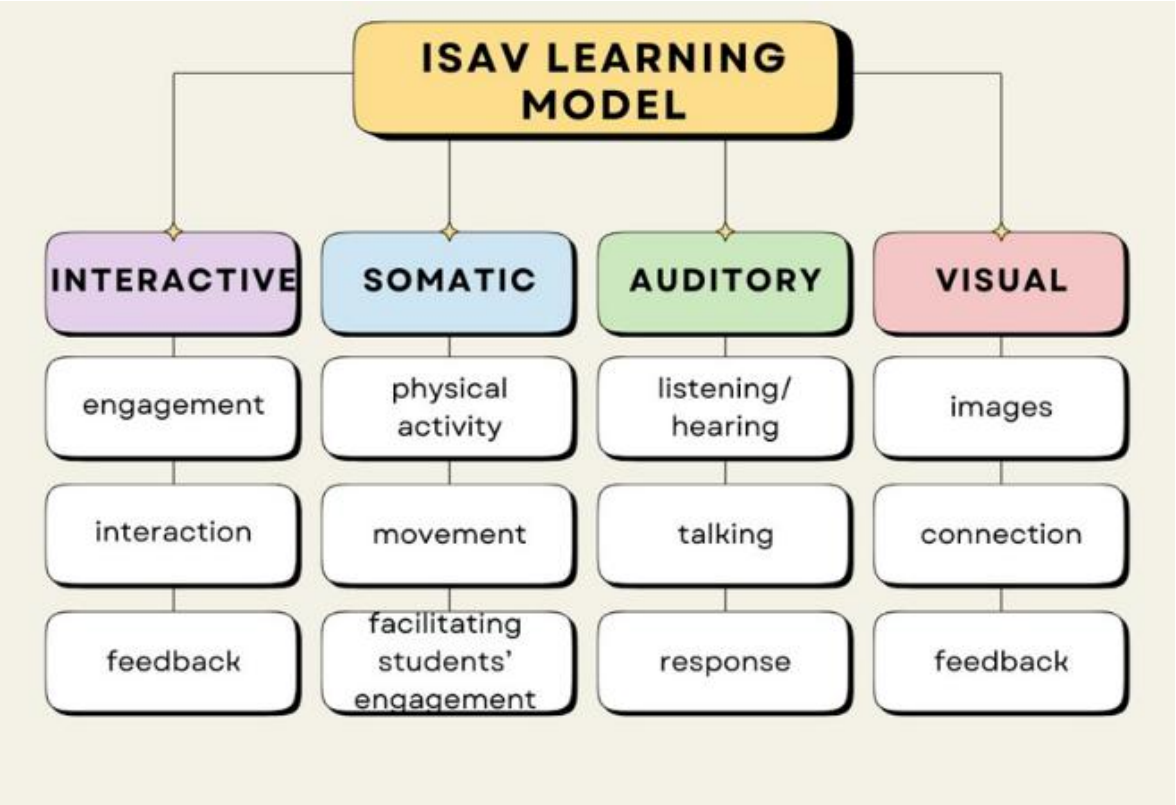


Figure 2. The interactive somatic auditory visual (ISAV) learning model.

The interactive component emphasizes communication, participation, and collaboration in the learning process. It is represented through activities such as games, role plays, and discussion-based tasks, which provide learners with opportunities to use language meaningfully. This component corresponds to the findings of the needs analysis, which showed a strong preference for interactive learning activities. The somatic component incorporates physical movement into learning activities. This component is intended to support embodied learning by linking language input with physical action and learner experience. Activities involving movement or action-based responses are expected to support vocabulary retention and meaning comprehension. This element also responds to young learners' preference for engaging and dynamic learning experiences.

The auditory component focuses on listening and speaking development. It includes songs, dialogues, listening tasks, and pronunciation practice to provide learners with meaningful auditory input. This component is particularly relevant to the identified necessity of developing oral communication skills and supporting phonological awareness.

The visual component provides visual support through pictures, animations, flashcards, and other visual aids. These materials help learners understand language meaning in context and support memory and comprehension. The inclusion of visual elements also reflects young learners' preference for multimodal learning environments.

Taken together, the four components form an integrated instructional model for TEYL. Rather than functioning separately, the interactive, somatic, auditory, and visual elements complement one another in supporting both receptive and productive language skills. Thus, the proposed model serves as the pedagogical basis for the development of the e-learning module prototype.

4.3. Prototype Design of The E-Learning Module

The final outcome of this study is a prototype design of an e-learning module that integrates the results of the needs analysis with the ISAV learning model. The module is organized into learning units that include objectives, activities, and assessments. Its design emphasizes the use of multimedia elements, such as audio, visuals, videos, and interactive exercises, to support multimodal learning.

The module also incorporates authentic and contextualized language use so that learning activities are relevant to young learners' daily experiences. This design is intended to provide opportunities for learners to use English in meaningful contexts and to support the development of communicative competence. In addition, the module includes formative assessment and feedback features that enable learners to monitor their progress during the learning process.

To illustrate how the design principles are implemented, **Figure 3** presents the prototype of the e-learning module and its integration of ISAV components. The prototype includes the title and competency section, learning activities such as Look and Listen, multimedia-based input supported by accessible video links, and interactive tasks such as the Time Flashcard Quiz and Pictures and Tell. These activities demonstrate how the module combines visual, auditory, somatic, and interactive elements within a structured digital learning environment. The module does not simply combine multiple media, but systematically aligns each feature with specific learning functions. Visual and auditory elements are used to introduce language input, interactive activities promote active learner participation, and somatic tasks encourage movement-based engagement. In this way, the prototype reflects a coherent application of the ISAV framework in the design of the e-learning module. The prototype serves as a flexible blueprint for developing learner-centered digital materials in TEYL contexts. Although the module has not yet been implemented or tested in classroom settings, it provides a theoretically grounded and empirically informed design framework for future development, implementation, and evaluation.

4.4. Interpreting Learners' Needs in TEYL Contexts

The findings of this study confirm the importance of aligning TEYL instructional design with young learners' developmental, cognitive, affective, and perceptual characteristics. The high ratings of the necessity items in **Tables 1** and **2** indicate that both teachers and students viewed foundational English competencies as important for young learners. Teachers gave the highest score to Q1, while students gave the highest score to Q2, suggesting that both groups shared similar concerns about learners' essential needs, although they differed slightly in priority.

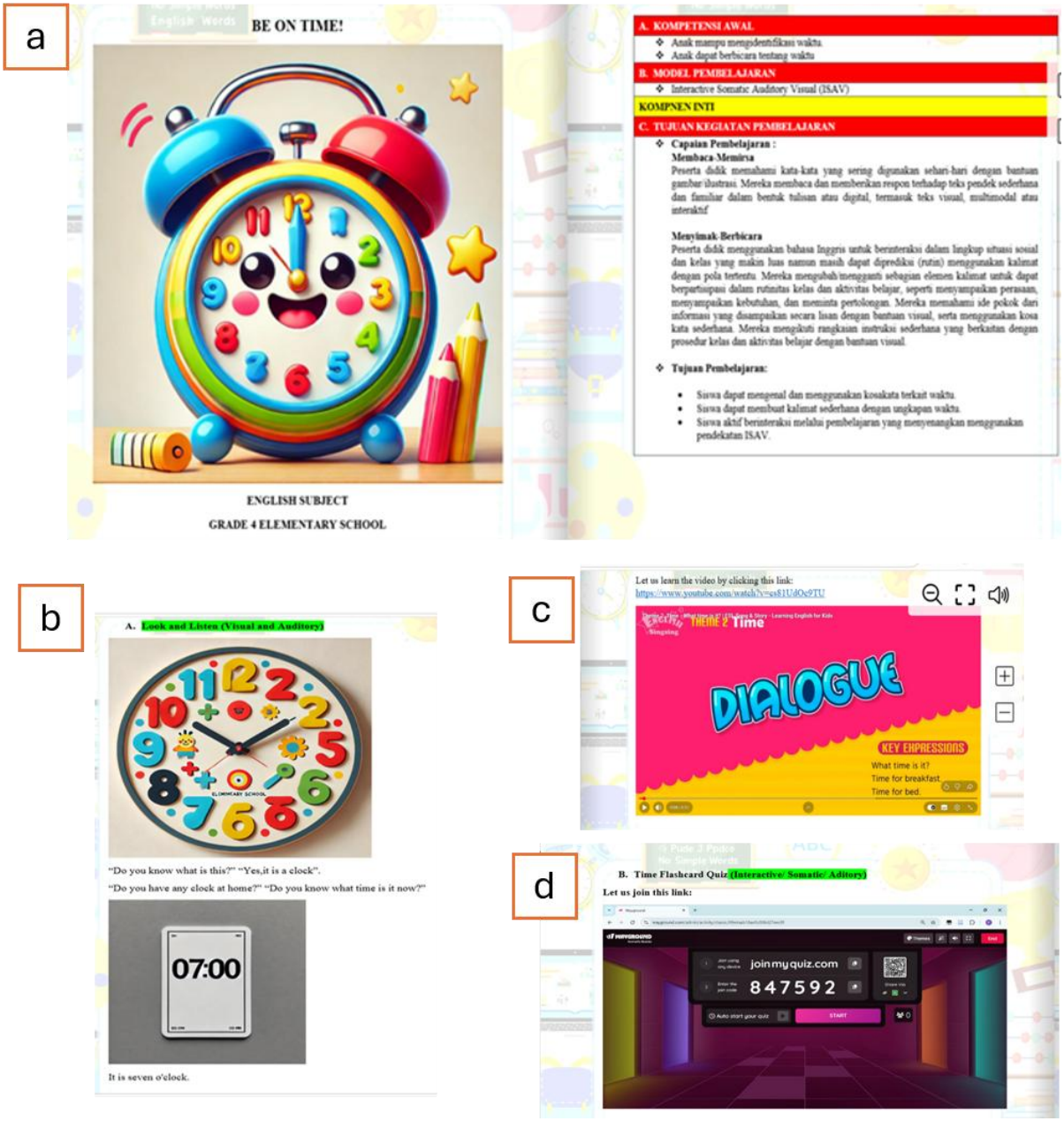


Figure 3. Prototype design of the e-learning module, showing components (a), (b), (c), and (d).

These findings imply that TEYL materials should provide balanced support for vocabulary development, reading comprehension, and oral communication. Vocabulary functions as an important basis for meaning-making, while reading supports early literacy and broader language exposure. Oral communication, meanwhile, enables learners to use English for basic interaction. This interpretation is consistent with previous studies emphasizing the role of phonological awareness, lexical growth, and early literacy skills in young learners' language development [2, 3].

The findings on learners' lacks reveal different emphases between the two respondent groups. Teachers rated Q4 as the most significant lack, whereas students rated Q6 as the highest. This difference suggests that teachers may focus more on difficulties directly

observed in classroom learning, while students may pay greater attention to broader instructional or systemic factors. Such divergence indicates that instructional design for TEYL should respond not only to learner-level difficulties but also to contextual factors that may influence the learning process.

The findings on learners' wants further highlight the importance of interactive and engaging learning environments. The high ratings of Q7, Q8, and Q9 indicate that teachers perceived young learners as needing learning activities that are participatory, enjoyable, and supportive of active involvement. Engagement in this context should not be understood merely as motivation, but also as a condition that supports attention, retention, and communicative participation. Previous studies suggest that interactive, multimodal, and perceptually responsive learning activities can support language learning processes, including vocabulary development and learner engagement [6, 14]. Therefore, the convergence of necessities, lacks, and wants suggests that TEYL instruction should be foundational, responsive, and engaging.

4.5. The Role of Needs Analysis in Instructional Design

The results show that needs analysis plays an important role in connecting learner data with instructional design decisions. By identifying learners' necessities, lacks, and wants, this study used needs analysis not only as a preliminary diagnostic step but also as a basis for developing the e-learning module prototype. In this sense, needs analysis functioned as a bridge between the empirical findings and the pedagogical features of the module.

The findings informed several aspects of the proposed module design, including the selection of learning competencies, instructional support, and multimodal activities. The necessity results guided the selection of language competencies to be emphasized in the module. The lack results helped identify areas that required instructional support, such as scaffolded learning activities and clearer language input. The want results informed the inclusion of interactive and multimodal activities. This process reflects a data-driven approach to instructional design, in which design decisions are grounded in learners' needs rather than based solely on general assumptions.

The use of needs analysis is also consistent with the Design-Based Research framework adopted in this study. Although the study was limited to the analysis and design phases, the alignment between problem identification and solution development reflects the early stages of DBR. Therefore, the proposed e-learning module should be viewed as a design prototype that can be further validated, implemented, and refined in future studies.

4.6. ISAV Learning Model as a Multimodal Design Framework

The integration of the ISAV learning model provides a pedagogical framework for responding to the needs identified in this study. The model brings together Interactive, Somatic, Auditory, and Visual components to support young learners' language development through multiple modes of engagement. This is relevant to TEYL because young learners often benefit from learning activities that involve interaction, movement, sound, and visual support. The interactive component addresses learners' need for participation and communicative practice. Through games, role plays, and collaborative tasks, learners are encouraged to use language meaningfully. The somatic component supports embodied learning by connecting language with physical movement and action. This is important

because gesture and movement can help young learners associate language forms with meaning and improve retention [7].

The auditory and visual components complement these processes by providing multimodal input. Auditory elements, such as songs, dialogues, and pronunciation practice, support listening and oral language development. Visual elements, such as pictures, flashcards, animations, and videos, help contextualize language input and support comprehension. Research has shown that auditory and visual input can contribute to phonological processing, memory, and language understanding when aligned with learning objectives [14]. In this study, ISAV was not treated as an abstract concept but was translated into concrete e-learning design features, as shown in **Figures 2** and **3**. Each component was linked to specific instructional functions: interaction for participation, somatic activity for embodied engagement, auditory input for listening and pronunciation, and visual support for comprehension. This alignment strengthens the coherence between learners' needs and the instructional design of the e-learning module.

4.7. Interpreting the E-Learning Module Design through ISAV

Figures 4 to **7** present examples of how interactive, somatic, auditory, and visual components are embedded in the module. These examples show that the module is not designed merely as a digital repository of materials, but as a structured learning environment that connects learner needs with multimodal instructional features.

The video-based activity in **Figure 4** demonstrates the integration of auditory and visual modalities. Through video input, learners are exposed to spoken language, visual context, and meaningful representations of vocabulary or expressions. This type of activity supports listening comprehension and vocabulary learning by presenting language in a more contextualized and engaging format.

The Time Flashcard Quiz in **Figure 5** represents the use of interactive and auditory elements. This activity allows learners to engage with the learning content actively through quiz-based practice. It also provides opportunities for recognition and recall, which are important in vocabulary and language structure learning.

Figure 6 provides an example of the task structure in the Time Flashcard Quiz. The task demonstrates how interactivity can be organized gradually by guiding learners from identifying language input to producing responses. This structure supports incremental learning because learners are not only exposed to the target language but also encouraged to process and respond to it.

The Pictures and Tell activity in **Figure 7** represents a more integrated use of ISAV components. Visual prompts are used to stimulate learners' ideas, while speaking activities provide auditory and oral language practice. The activity may also involve somatic engagement when learners draw, point, arrange, or present visual materials. In addition, interaction occurs when learners share their responses with peers or teachers.

Taken together, **Figures 4** to **7** show that each learning activity is designed to support specific pedagogical functions. Visual elements help contextualize meaning, auditory input supports listening and pronunciation, interactive tasks encourage learner participation, and somatic activities connect language with action or physical engagement. This alignment is important because multimodal learning is most meaningful when different modes are connected to learning objectives rather than simply added as decorative media.

Let us learn the video by clicking this link:
https://www.youtube.com/watch?v=cs81UdOc9TU



Figure 4. Video-based learning activity accessed through the provided link.

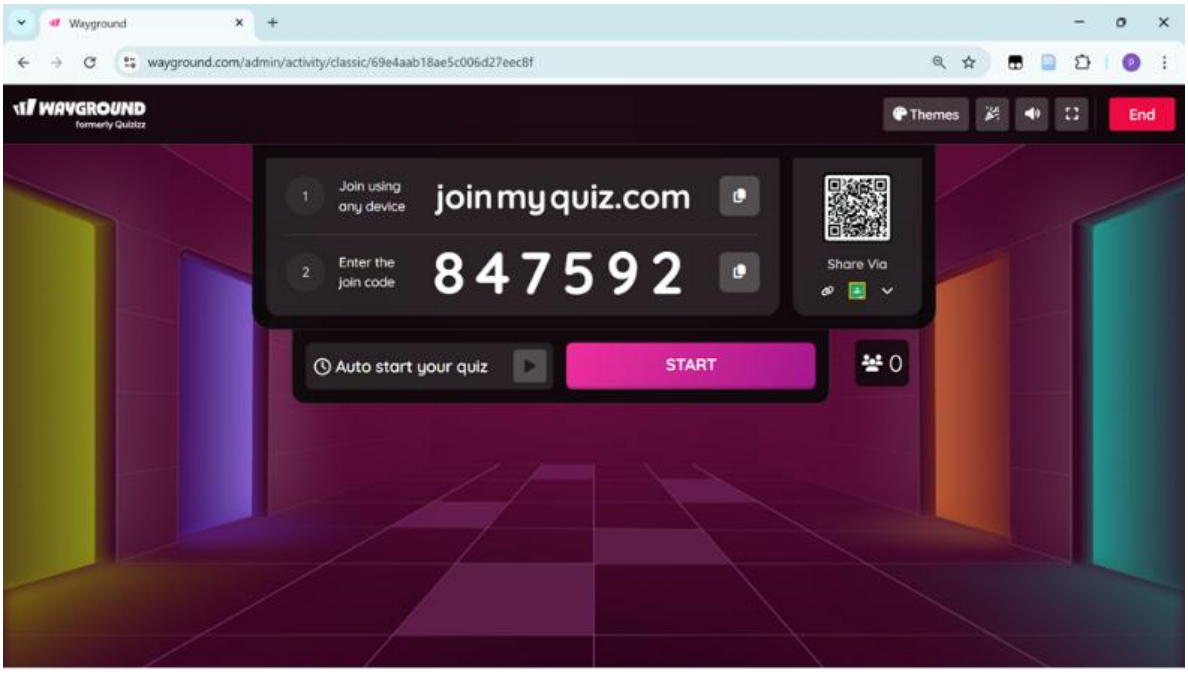


Figure 5. Time flashcard quiz.

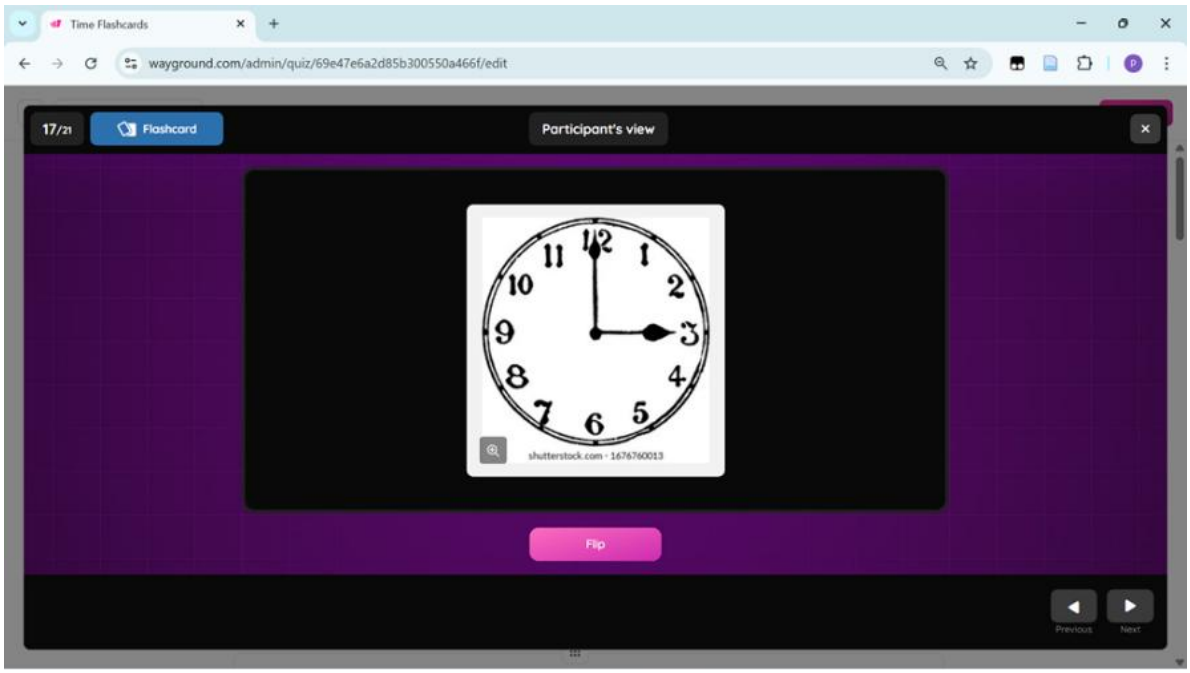


Figure 6. Example task from the Time Flashcard Quiz.

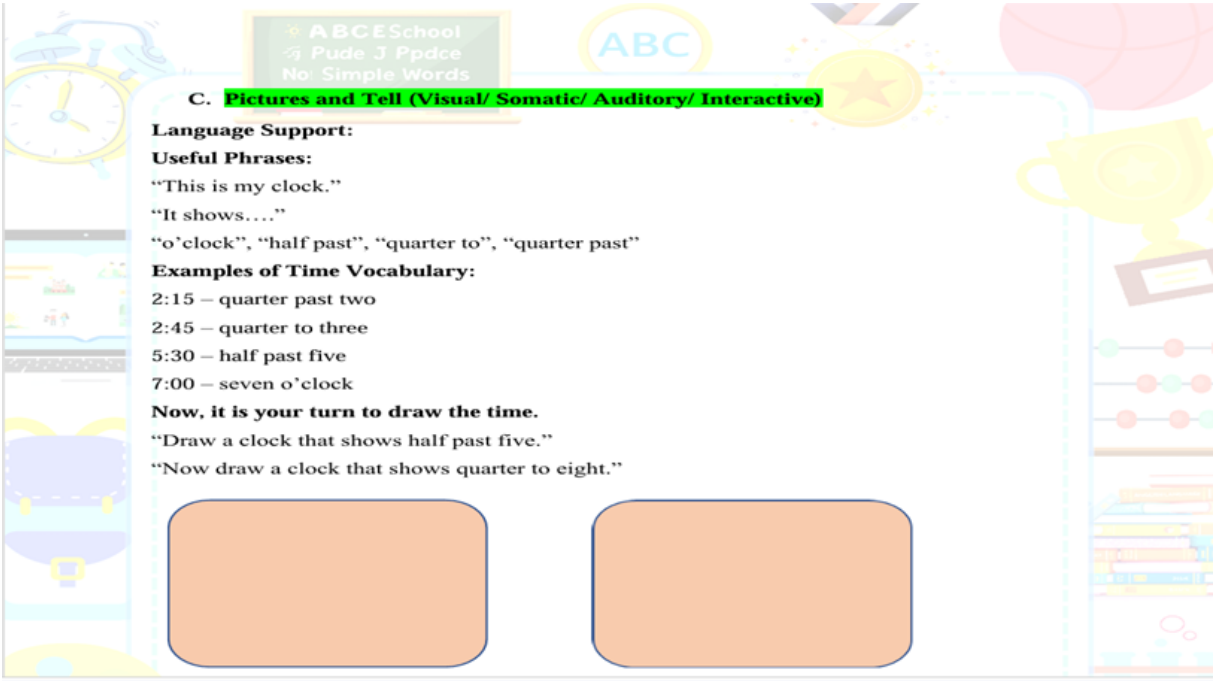


Figure 7. Pictures and tell activity.

Thus, the e-learning module reflects a systematic application of the ISAV framework. The module integrates multiple modalities to support different aspects of young learners' English development, including vocabulary learning, listening comprehension, oral communication, and learner engagement. Although the module has not yet been implemented in classroom practice, its design provides a clear basis for future validation, testing, and refinement.

4.8. Implications for Technology-Enhanced Language Learning

The findings of this study offer several implications for the design of technology-enhanced language learning materials, particularly in TEYL contexts. First, the study highlights the importance of aligning technological features with pedagogical purposes. The value of an e-learning module does not depend solely on the presence of digital media, but on how audio, visuals, interaction, and assessment are designed to respond to learners' needs and instructional goals. Second, the study emphasizes the role of interactivity in digital language learning. The inclusion of quizzes, interactive tasks, and communicative activities suggests that e-learning can provide opportunities for active learner participation. When combined with feedback and structured practice, interactive features can support learner engagement and help learners monitor their progress during the learning process. Third, the integration of ISAV components shows that e-learning design should accommodate diverse learner characteristics. Young learners may differ in cognitive readiness, language exposure, attention span, and learning preferences. By incorporating interactive, somatic, auditory, and visual elements, the module offers multiple pathways for learners to access and process language input. This is relevant to inclusive and learner-centered instructional design because it allows learning materials to address varied perceptual and learning needs.

Finally, learner engagement can be intentionally supported through the integration of pedagogical principles and digital affordances. In the proposed module, engagement is facilitated through meaningful interaction, movement-based activities, audiovisual input, and contextualized tasks. From a broader perspective, the integration of technology in education should be accompanied by appropriate pedagogical planning, institutional support, and alignment with learners' needs [23, 24]. Developments in English education also increasingly involve the use of artificial intelligence, project-based approaches, and culturally contextualized learning content, indicating the growing diversity of instructional innovation in the field [25-28].

5. CONCLUSION

This study developed a data-driven e-learning module prototype for Teaching English to Young Learners by integrating needs analysis with the ISAV learning model. The findings of the needs analysis showed that learners' necessities were related to foundational English competencies, particularly vocabulary, reading, and oral communication. The identified lacks reflected both learner-level difficulties and broader instructional concerns, while the wants indicated the importance of interactive and engaging learning activities. These findings were translated into an ISAV-based e-learning module prototype that incorporates interactive, somatic, auditory, and visual components. The prototype includes structured learning units, audiovisual input, interactive quizzes, movement-based activities, visual materials, and formative assessment tasks. In this way, the study provides a data-to-design framework that links learners' necessities, lacks, and wants with concrete e-learning design features. The main contribution of this study lies in demonstrating how empirical needs-analysis findings can be systematically translated into the design of multimodal digital learning materials for TEYL. However, the study was limited to the analysis and design phases. The module has not yet been implemented or tested in classroom settings. Therefore, future research should involve expert validation, classroom implementation, iterative refinement, and evaluation of the module's effectiveness in supporting young learners' English development.

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7. AUTHORS' NOTE

The authors declare that there is no conflict of interest regarding the publication of this article. The authors confirmed that the paper is free from plagiarism.

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