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Development of "TransVoca" Interactive Learning Media Based on Articulate Storyline for Elementary English Vocabulary Learning

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Abstract

The acquisition of English vocabulary at the elementary education level frequently relies on passive rote learning methods, resulting in low memory retention and student disengagement. This study aims to design, develop, and evaluate the feasibility of an interactive multimedia learning application named "TransVoca" to enhance transportation vocabulary acquisition for fourth-grade elementary students. This research employs a Research and Development (R&D) approach, adapting the initial three stages of the Lee and Owens development model: Assessment/Analysis, Design, and Development. Data were collected through expert validation questionnaires and analyzed utilizing descriptive percentage statistics to determine the product's feasibility. The evaluation results revealed a feasibility score of 96.25% from the media expert and 90.00% from the material expert, culminating in an overall average of 93.13%. These findings confirm that the Articulate Storyline-based learning media, which integrates text, images, audio pronunciation, video, and interactive gaming activities, is categorized as highly feasible. The implications of this study suggest that the use of interactive multimedia can minimize extraneous cognitive load and actively foster students' self-directed learning. Ultimately, this innovation offers a practical solution to optimize the use of digital infrastructure in schools and transforms conventional language learning into a highly interactive, student-centered experience.

Keywords: Articulate Storyline, English Vocabulary, Interactive Learning Media

1. Introduction

The era of globalization demands English proficiency as a fundamental competence that must be possessed by every individual in facing the dynamics of the twenty-first century. Global statistical data indicate that more than 1.5 billion people are currently learning English, making it one of the most dominant second languages in the world. The introduction of this international language at the elementary education level has become a strategic priority in various educational systems to comprehensively prepare future generations. Massive digital transformation has further accelerated this urgency by dominating information access and communication technology within the global pedagogical landscape. In this regard, (Haleem et al., 2022)emphasized that the integration of digital technology in education is no longer an optional complement, but an absolute necessity to ensure the quality of educational outcomes.

The most essential element in the successful acquisition of English during the early stages of education is vocabulary mastery. Vocabulary serves as the primary foundation that supports the development of four crucial linguistic skills, namely reading, writing, listening, and speaking. Unfortunately, the global impact of conventional teaching methods often results in high levels of vocabulary memory loss among young learners. Teacher-centered instruction causes the process of acquiring new words to become slower and less meaningful within children's cognitive development. This finding is reinforced by (Alhazmi, 2024), who

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concluded that the lack of multimedia stimulation in learning significantly contributes to the low level of students' long-term memory retention.

English language learning practices at the elementary school level continue to face various complex pedagogical challenges. Psychologically, many students still perceive English as a difficult subject because its spelling and pronunciation structures differ substantially from their mother tongue. In addition, traditional vocabulary memorization methods have proven ineffective because students tend to forget newly memorized words within a relatively short period of time. As a consequence, teachers frequently experience uncertainty regarding whether students have successfully achieved the intended learning objectives and instructional indicators. Responding to this condition, (Kinasih & Wijayanti, 2024) stated that improving teachers' competence in maximizing digital technology has become increasingly urgent in addressing vocabulary acquisition difficulties.

Similar structural problems were also empirically identified in elementary education settings, particularly at SD Muhammadiyah 5 Malang. Based on the results of preliminary observations, fourth-grade students demonstrated low levels of engagement and quickly experienced boredom, especially when learning transportation vocabulary materials. Modern technological facilities such as Interactive Flat Panels available in classrooms had not been utilized optimally as tools for independent exploration. Teachers remained dependent on printed textbooks and one-way lecture methods, which automatically triggered surface learning phenomena. If such monotonous conditions continue, (Asbah et al., 2025) warned that students' conceptual understanding and learning interest may decline significantly.

Resolving these issues is highly urgent to prevent the development of permanent negative perceptions toward English learning among students. The failure of educational institutions to establish strong vocabulary foundations during childhood may hinder students' linguistic competence development at higher educational levels. Therefore, transforming rigid learning environments into highly interactive learning ecosystems must be realized to restore students' intrinsic motivation. Educational institutions consequently require innovative digital learning media that are not only visually attractive but also capable of accommodating the learning styles of contemporary students. Related to this urgency, (Afifa & Astuti, 2024) quantitatively demonstrated that appropriately designed digital learning media interventions can significantly improve both students' motivation and learning outcomes.

The development plan for interactive learning media proposed in this study is strongly grounded in the Cognitive Theory of Multimedia Learning (CTML) as the primary theoretical foundation. This grand theory formulates the essential principle that individuals process information more meaningfully through the harmonious combination of textual narration and visual representation. The dual-channel processing system within human cognition enables learners to receive auditory and visual stimuli simultaneously without overloading their working memory capacity. Instructional designs that incorporate multimedia elements are scientifically believed to reduce excessive extraneous cognitive load during information encoding processes. In this context, (Mayer & Fiorella, 2021) underlined that comprehensive mental representations constructed through multimedia integration are fundamental to creating meaningful and long-lasting cognitive learning.

The evolution of theoretical perspectives in educational technology has shifted significantly from the use of static digital media toward the integration of highly dynamic

gamification elements. Language learning approaches based on educational games provide immediate feedback mechanisms that psychologically function as positive reinforcement for learners. Kinesthetic interaction through drag-and-drop activities encourages learners not only to memorize vocabulary but also to actively construct spelling patterns and contextual meanings. This conceptual shift confirms that play activities are no longer viewed merely as recreational tools but as higher-order cognitive instruments capable of maintaining children's attention and concentration. In line with this paradigm, (Chowdhury et al., 2024) documented that digital language games possess remarkable effectiveness in accelerating vocabulary acquisition among school-age learners.

In response to both field urgencies and theoretical foundations, the utilization of Articulate Storyline is proposed as the most promising technological solution design. This advanced software provides rich visual programming features that enable educators to develop interactive multimedia applications without requiring complex programming language mastery. The platform's capability to integrate audio recordings, animated videos, bilingual texts, and structured quizzes into a unified interface is highly coherent with CTML design principles. Furthermore, its HTML5-based output flexibility ensures that the developed media can operate smoothly across various portable devices and interactive classroom displays. Supporting this perspective, (Daryanes, Darmadi, & Febrita, 2023) concluded that the development of instructional devices based on Articulate Storyline is highly necessary to bridge interaction gaps within the era of educational disruption.

Although numerous previous studies have extensively explored the effectiveness of Articulate Storyline, most academic investigations have primarily concentrated on science and mathematics disciplines. Several recent studies highlighted the successful implementation of this software in improving critical thinking skills in natural science learning at the elementary school level (Legina & Sari, 2022). On the other hand, the specific application of this technology to facilitate English transportation vocabulary acquisition through integrated interactive game activities for fourth-grade elementary students remains considerably underexplored. This research gap validates the novelty position of the present study, as no previous study has comprehensively integrated transportation-themed English vocabulary learning with Articulate Storyline-based gamification. In response to this gap, (Fitriyani et al., 2026)also recommended diversifying the utilization of interactive media in linguistic subjects to enrich the body of educational technology literature.

Based on the identified gaps and educational problems, this study aims to design, develop, and evaluate the feasibility of an interactive learning media entitled "TransVoca." Conceptually, the theoretical contribution of this study is expected to enrich academic discourse concerning the implementation of multimedia cognitive theory within gamified language learning ecosystems. The novelty of this study is represented through the development of a child-friendly interface design integrated with non-linear navigation architecture and automatic auditory feedback features. Practically, this development research is expected to provide alternative instructional instruments for educators in optimizing classroom technological infrastructure while simultaneously fostering students' independent cognitive exploration. Strengthening this perspective, (Daryanes, Darmadi, Fikri, et al., 2023) summarized that the availability of well-structured interactive media is highly essential in equipping young generations with holistic problem-solving foundations.

2. Method

This study employs a Research and Development (R&D) approach, primarily focusing on the development and feasibility of interactive learning media. The instructional design model adopted for this study is the Lee & Owens (2004) framework. The selection of this model is justified by its comprehensive structure, which is specifically tailored for multimedia-based instructional development. Given the scope and objectives of this study, which focuses on instrument validity, the Lee & Owens procedure was adapted to include only the first three stages: Analysis, Design, and Development. The implementation and field evaluation stages were not conducted in this phase of the research.

The initial research and data collection were conducted at SD Muhammadiyah 5 Malang. The informants in this study were categorized into two groups corresponding to the development stages. During the needs assessment stage, the primary informant was the English subject teacher. Conversely, during the product feasibility testing phase, the evaluators consisted of one Subject Matter Expert and one Media Expert, both possessing relevant academic qualifications in educational technology and English language teaching.

The research procedure commenced with the Analysis stage, where the researcher identified problems related to the students' transportation vocabulary acquisition, learner characteristics, and the technological facilities available at the school. The second stage, Design, involved drafting a storyboard, mapping the media flowchart, designing the user interface, and compiling supporting visual and audio assets. The third stage, Development, focused on the authoring process of the interactive media utilizing Articulate Storyline software. This stage concluded with expert validation to assess the feasibility of the media.

Both qualitative and quantitative data were collected in this study. Qualitative data were obtained from interviews with the teacher regarding the media needs analysis, as well as from the feedback and improvement suggestions provided by the expert validators. On the other hand, quantitative data were derived from the assessment scores on the validation questionnaires filled out by the material and media experts. The main instruments utilized included a semi-structured interview guide and a Likert-scale questionnaire for the feasibility test.

The data analysis techniques were applied based on the nature of the data. Qualitative data were analyzed descriptively to formulate the rationale for product development and to revise the media prototype. Meanwhile, the quantitative data from the validation questionnaires were analyzed using descriptive statistics in the form of percentages.

The quantitative data from the validation questionnaires were analyzed using descriptive statistics in the form of percentages. The formula used to calculate the feasibility percentage (P) is:

$$P = \left(\frac{\Sigma x}{\Sigma X}\right) \times 100\%$$

Where Σx represents the total score of the respondent's answers and ΣX represents the maximum total score. The resulting percentage was then converted into feasibility interpretation criteria as follows:

< 40% (Not Feasible)
41% - 60% (Fairly Feasible)
61% - 80% (Feasible),
81% - 100% (Highly Feasible).

3. Results and Discussion

3.1 Result

The needs analysis stage revealed that English vocabulary learning at SD Muhammadiyah 5 Malang was predominantly driven by conventional memorization methods, which precipitated surface-level learning. Fourth-grade students exhibited low memory retention rates and frequently lost focus, primarily due to the lack of interactive engagement and adequate visual stimulation. Furthermore, the school's technological facilities, such as the Interactive Flat Panel (IFP), were underutilized as interactive media and merely served as one-way presentation tools for teachers. This discrepancy between communicative learning objectives and actual classroom practices established a strong rationale for the urgent development of interactive multimedia learning tools.

In response to these critical issues, the researcher successfully developed an interactive learning media named "TransVoca" utilizing *Articulate Storyline* software. This media was specifically designed to facilitate the acquisition of transportation vocabulary through a child-friendly interface, characterized by a bright color palette and relevant cartoon illustrations. The navigation structure was developed non-linearly via interactive buttons, empowering students to control their learning process independently using computers or the classroom IFP. The primary visual interface of this product was meticulously crafted to foster a contextual, immersive, and engaging learning environment tailored to the cognition of elementary students.



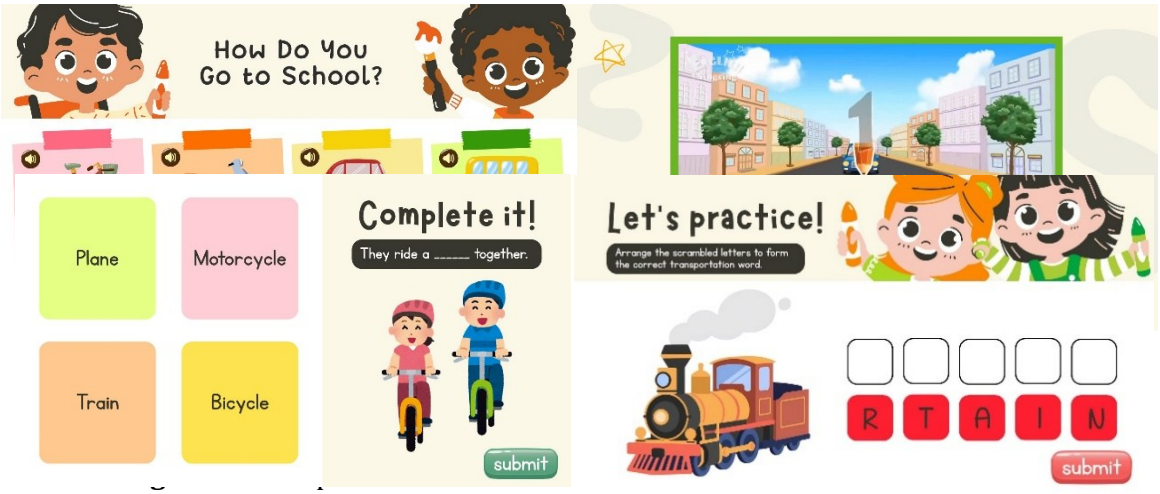
Figure 1. Initial Screen of the Learning Media



Figure 2. Main Menu Display

Structurally, TransVoca integrates comprehensive learning materials through the main menus of *Vocabulary*, *Sing Together*, and *Educational Games*. Within the *Vocabulary* menu, each vehicular illustration is accompanied by bilingual text and an audio pronunciation feature to model highly accurate English articulation. Meanwhile, the interactive gaming components encompass multiple-choice quizzes and a *Word Builder* that adopts a drag-and-drop mechanism to interactively train students' spelling skills. The interface design of these

gamified activities was structured to deliver an enjoyable learning-through-play experience without compromising the core educational substance.



Media validation was conducted to determine the feasibility of the developed learning media before its implementation in the learning process. In this development research, the validation process involved both material experts and media experts to obtain evaluations and feedback regarding the content quality, visual design, and functionality of the developed learning media. The results of the validation process are presented as follows.

Table 1. Validation Results Data

No	Validation	Percentage	Feasibility Criteria
1.	Media Expert	96,25%	Highly Feasible
2.	Material Expert	90,00%	Highly Feasible
	Average	**93,13%**	**Highly Feasible**

3.2 Discussion

The successful design and development of "TransVoca" directly address the first research objective by creating an instrument capable of mitigating the issue of surface learning. The harmonious integration of visual elements, text, and audio narration within a single digital platform aligns with the dual-channel principle of the Cognitive Theory of Multimedia Learning (Mayer, 2021). This combination of multisensory stimuli effectively minimizes extraneous cognitive load, enabling students to process new vocabulary information into their long-term memory schemas much more efficiently.

The product's feasibility rate of 93.13% represents the fulfillment of highly rigorous pedagogical and technical standards, which comprehensively answers the second research objective. The primary comparative advantage of TransVoca lies in its audio pronunciation feature and accessibility flexibility, allowing for the implementation of self-directed learning across various school hardware infrastructures. This technical flexibility

directly resolves the underutilization of facilities such as the IFP while simultaneously providing a safe space for students to practice pronunciation repeatedly without academic anxiety. These exceptionally high validation results serve as empirical evidence that the adaptation of a systematic instructional design model can yield a solid product responsive to the dynamics of field requirements.

Although proven to be highly feasible and functional, the development of this interactive media still possesses several academic and technical limitations that must be objectively acknowledged. The exclusive instructional focus on transportation vocabulary restricts the media's scope, meaning the instrument has not yet addressed language competencies requiring higher-order thinking skills. Additionally, the absence of a learning management analytics system prevents teachers from automatically monitoring individual cognitive progress through the digital platform. Therefore, further research is highly recommended to integrate a database tracking system and to evaluate the product's effectiveness quantitatively through comprehensive field experiments.

4. Conclusion

This study has successfully designed and developed "TransVoca" as an *Articulate Storyline*-based interactive learning media to overcome the issue of low English vocabulary retention among fourth-grade elementary students. The final validation results demonstrated that this product achieved an average feasibility rate of 93.13%, which empirically confirms the initial hypothesis that the media is highly feasible for instructional implementation. Theoretically, the successful integration of visual elements, bilingual text, and audio pronunciation features within this media reinforces the premise of the Cognitive Theory of Multimedia Learning regarding the efficacy of dual-channel cognitive processing. From a practical perspective, the incorporation of educational gaming features has proven capable of transforming passive rote learning patterns into an interactive and enjoyable self-directed learning experience. Furthermore, the accessibility flexibility of this media provides a tangible contribution for schools to optimize the utilization of previously underutilized digital infrastructure, such as the Interactive Flat Panel.

Despite its proven high feasibility in instructional design, this developmental research possesses limitations as the content exclusively focuses on surface-level basic vocabulary and has not yet accommodated higher-order thinking skills. Additionally, the absence of an automated tracking analytics system within the platform prevents teachers from monitoring students' individual cognitive progress in an integrated manner. Therefore, future research is highly recommended to develop embedded learning database features and to evaluate the media's true effectiveness on student learning outcomes through large-scale field experiments. Educators are also advised to proactively adopt such digital gamification instruments to cultivate a more modern and student-centered classroom ecosystem. Ultimately, continuous innovation in the development of instructional media plays a crucial role in equipping the younger generation with a foundational foreign language literacy that is adaptive to the challenges of the digital era.

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