

Developing VOCAYO: A Tourism-Based Vocabulary Learning Application for EFL Students in Takengon

Nyak Mutia Ismail^{1*}, Nora Fitria²

^{1,2} Prodi Pendidikan Bahasa Inggris, Universitas Serambi Mekkah, Jalan Unmuha, Batoh, Kota Banda Aceh, Aceh 23245

E-mail: nyakmutiaismail@serambimekkah.ac.id¹,

norafitria@serambimekkah.ac.id²

Abstract

This study investigated the development of VOCAYO, a digital vocabulary learning application designed for EFL learners in *Takengon*, Central Aceh, with a specific focus on tourism contexts. Using Dick and Carey instructional design model, the research followed six systematic phases: needs assessment, instructional analysis, learner and context analysis, formulation of objectives, development of assessment instruments, and prototype design. Quantitative data were analyzed using descriptive statistics, including frequencies, percentages, means, and modes, while qualitative data were thematically analyzed through coding, categorization, and theme development, followed by triangulation across participant groups. The findings revealed a persistent gap between English instruction and the communicative demands of the tourism sector. The students and the teachers highlighted the lack of contextualized vocabulary, while the practitioners identified recurring situations requiring descriptive, hospitality, and transactional language. Despite these gaps, learners demonstrated strong motivation, high smartphone ownership, and readiness for digital learning. VOCAYO was, therefore, designed as a mobile-friendly, offline-capable app integrating tourism-based vocabulary, interactive tasks, and embedded assessments that ensure objectivity, usability, and fairness. The study contributes to mobile-assisted language learning (MALL) by embedding localized, socio-economic content into digital tools, bridging the divide between classroom instruction and real-world tourism communication.

Keywords: EFL; instructional design; mobile-assisted language learning; tourism vocabulary; VOCAYO.

Pengembangan VOCAYO sebagai Aplikasi Pembelajaran Kosakata Berbasis Pariwisata bagi Siswa EFL di Takengon

Abstrak

Penelitian ini melaporkan pengembangan VOCAYO, sebuah aplikasi digital untuk pembelajaran kosakata yang dirancang bagi pelajar EFL di Takengon, Aceh Tengah, dengan fokus khusus pada konteks pariwisata. Menggunakan model desain instruksional Dick dan Carey, penelitian ini mengikuti enam fase sistematis: analisis kebutuhan, analisis instruksional, analisis peserta didik dan konteks, perumusan tujuan, pengembangan instrumen penilaian, serta perancangan prototipe. Data kuantitatif dianalisis menggunakan statistik deskriptif yang meliputi frekuensi, persentase, rerata, dan modus, sedangkan data kualitatif dianalisis secara tematik melalui proses pengodean, pengategorian, dan pengembangan tema, yang dilanjutkan dengan triangulasi antarkelompok partisipan. Hasil penelitian menunjukkan adanya kesenjangan yang konsisten antara pengajaran bahasa Inggris dan tuntutan komunikasi di sektor pariwisata. Siswa dan guru menyoroti kurangnya kosakata kontekstual, sementara praktisi mengidentifikasi situasi berulang yang membutuhkan bahasa deskriptif, pelayanan, dan transaksional. Meskipun terdapat kesenjangan tersebut, siswa menunjukkan motivasi tinggi, kepemilikan smartphone yang luas, serta kesiapan untuk belajar secara digital. Oleh karena itu, VOCAYO dirancang sebagai aplikasi yang ramah seluler, dapat digunakan secara offline, serta mengintegrasikan kosakata berbasis pariwisata, tugas interaktif, dan penilaian bawaan yang menjamin objektivitas, kemudahan, serta keadilan. Penelitian ini berkontribusi pada

ranah mobile-assisted language learning (MALL) dengan mengintegrasikan konten lokal dan sosio-ekonomi ke dalam media digital, sehingga menjembatani kesenjangan antara pembelajaran di kelas dan komunikasi nyata di bidang pariwisata.

Kata kunci: EFL; instructional design; mobile-assisted language learning; tourism vocabulary; VOCAYO

INTRODUCTION

Language proficiency is a key competency in the era of globalization, where cross-cultural communication is indispensable (Monica et al., 2022). Among the four macro-skills, vocabulary mastery stands as the cornerstone of communicative competence because words are the building blocks of comprehension and expression. Without adequate lexical knowledge, learners are still unable to articulate ideas fluently, understand authentic texts, or engage effectively in real-life interactions. This claim is repeatedly asserted in applied linguistics: vocabulary is not simply a component of language learning, but the foundation on which all other skills rely (Taufik et al., 2021). Yet, despite its undeniable importance, vocabulary remains a persistent barrier for English as a Foreign Language (EFL) learners in Asia, particularly in Indonesian contexts (Kemendikbud-ristek, 2023).

This challenge globally manifests in paradoxical ways. Learners today are exposed to vast amounts of English through digital media, online content, and social platforms (Sari & Setiawan, 2023). Theoretically, such immersion should accelerate vocabulary growth. In practice, however, this incidental learning is fragmented, unstructured, and disconnected from learners' academic or professional needs. International surveys such as PISA and EF EPI continue to show that Indonesian learners score low in reading comprehension and lexical proficiency. This paradox underscores a global issue: abundant exposure does not automatically translate into meaningful vocabulary acquisition.

What is needed are structured, engaging, and contextually relevant pathways that transform exposure into mastery (Darmawati, 2018).

Against this global backdrop, the local context of Takengon, in Central Aceh, illustrates the urgency of addressing vocabulary acquisition in a more targeted way. Takengon is a well-known tourism destination, celebrated for its natural beauty, cultural heritage, and Lake Lut Tawar, attracting both domestic and international visitors (Dasril et al., 2024). For young people in Takengon, the ability to communicate in English is not a mere academic asset; it is a potential economic advantage. Tourism requires direct interaction with foreign visitors, and successful engagement that depends on practical, situation-specific vocabulary (Pratiwi et al., 2022). Unfortunately, English instruction in many schools in Takengon remains dominated by theoretical approaches, textbook-based lessons, and decontextualized drills. Students may memorize lists of words but struggle to apply them in real-life scenarios such as giving directions, explaining local culture, or serving customers in tourism settings. Teachers, likewise, often lack contextually adaptive teaching materials that bridge classroom learning with local realities.

This discrepancy creates a crucial problem: the students in Takengon are not sufficiently equipped with the vocabulary knowledge required for authentic communication in tourism contexts, despite the region's economic reliance on this sector (Kurniawan, 2022). At the same time, rapid technological advances have opened pathways for localized digital learning.

Mobile devices are pervasive among youth in Takengon, providing a ready infrastructure for mobile-assisted language learning (MALL). Yet, most available apps, Duolingo, Busuu, Memrise, are designed for global audiences, offering generic content that does not align with local needs. This results in both disengagement and inefficiency, as learners fail to see the immediate relevance of the vocabulary they practice (Novela et al., 2024).

The aim of the present study is, therefore, twofold. First, it seeks to design and develop VOCAYO, a digital vocabulary learning application tailored to the needs of EFL learners in Takengon, integrating tourism-related contexts and communicative scenarios. Second, it aims to evaluate the effectiveness of VOCAYO in improving learners' vocabulary mastery, motivation, and autonomous learning through systematic trials in local schools (Syahputri, Ismail, Kismullah, et al., 2024). By positioning VOCAYO as both a pedagogical tool and a socio-economic enabler, the study contributes to bridging the gap between English instruction and local tourism demands (Fata & Mutia, 2017).

The significance of this study lies in its multidimensional impact. At the individual level, learners who master context-specific vocabulary gain confidence and competence to participate in real communication. At the institutional level, schools are provided with innovative media that enrich classroom practices and reduce dependence on rote memorization. At the community level, empowering youth with communicative skills enhances their participation in the local tourism economy, thereby linking education with economic development (Moriyanti et al., 2019). At the national level, VOCAYO aligns with Indonesia's digital transformation agenda, supporting the integration of adaptive educational technology in diverse regions beyond urban centers (Rahman et al., 2022).

Several previous studies have attempted to address vocabulary learning through digital or mobile media. Azar and Nasiri (2014) demonstrated that mobile-based vocabulary exercises significantly increased learner autonomy and retention. Chen and Hsu (2020) designed a gamified vocabulary app for Taiwanese learners, showing that gamification enhanced motivation but required careful scaffolding to avoid distraction. In the Indonesian context, Fitriani et al. (2019) used Quizlet with senior high school students and found improvements in short-term recall, though long-term mastery was limited. Setiawan and Sulisty (2021) piloted a locally developed vocabulary game, which students enjoyed, yet the study lacked evidence of deep vocabulary knowledge gains. These studies confirm that digital tools can support vocabulary learning, but they also reveal common shortcomings: generic content, short-term focus, and limited contextual integration.

What is notably absent from the literature is a systematic attempt to embed local tourism contexts within vocabulary learning applications (Hanief et al., 2024). While gamification and mobile learning have been extensively studied, few initiatives have aligned vocabulary lists, communicative tasks, and cultural content with the socio-economic realities of specific regions (Kanca, 2024). This gap is crucial because vocabulary is not neutral; it is always situated within discourse communities and communicative purposes. Teaching "airport vocabulary" is of limited relevance in Takengon, where students are more likely to interact with tourists in coffee shops, homestays, or ecotourism sites (Aji, 2016). Without this contextual adaptation, vocabulary learning remains abstract and demotivating (Kemendikbud, 2020).

The novelty of this study lies in developing VOCAYO as a context-driven, curriculum-aligned, and empirically validated digital tool.

Unlike global apps that merely prioritize breadth of vocabulary, VOCAYO emphasizes both breadth and depth, selecting lexical items based on local communicative needs and embedding them in meaningful scenarios. It integrates spaced repetition, interactive exercises, and cultural references specific to Takengon's tourism context. Furthermore, VOCAYO is evaluated not only for its usability but also for its impact on learners' motivation and autonomy, dimensions often overlooked in earlier research (Octaviana et al., 2022). In doing so, this study extends the discourse on MALL by showing how digital applications can move beyond globalized, one-size-fits-all models toward localized, needs-based innovations (Asri et al., 2023).

Based on these aims and theoretical underpinning, the study addresses the following research questions:

- 1) What are the needs and existing competencies of students and teachers in learning English for local tourism?
- 2) What communicative situations do local tourism practitioners typically face with foreign visitors?
- 3) How can VOCAYO be de-signed to meet students' needs within the context of Takengon's tourism sector?

Through these questions, the study situates VOCAYO at the intersection of pedagogy, technology, and socio-economic development. It does not merely seek to add another digital tool to the crowded field of MALL, but to demonstrate how technology, when localized and contextually informed (Akbulut, 2007), can transform vocabulary learning into a practice that is academically empowering and socially meaningful (Jayanti & Adlini, 2024).

METHOD

Research Design

This study adopts a Research and Development (R&D) approach, applying the Dick and Carey

instructional design model as the guiding framework. The Dick and Carey model is recognized for its systematic and procedural nature, which emphasizes the alignment between identified learner needs, instructional goals, and assessment strategies (Febriani et al., 2022). Its structure begins with needs assessment, followed by goal setting, instructional analysis, learner and context analysis, formulation of objectives, development of assessment instruments, and design of instructional materials, ensuring that every stage of product development is empirically grounded and pedagogically justified (Fauzi et al., 2021).

The model is particularly suitable for this study for two reasons. First, it prioritizes the relationship between contextual demands and instructional design (Usman et al., 2019), which is critical in developing a vocabulary application rooted in the tourism sector of Takengon. Second, its iterative cycle of evaluation and revision enables continuous refinement of the product, preventing the application from being a mere technological prototype and instead evolving into a validated educational medium. By employing this model, VOCAYO was conceptualized not only as a digital vocabulary tool but as an instructional system directly linked to local communicative demands in tourism.

Participants

The participants of this study were purposively selected from three key groups to ensure comprehensive insights into the design and relevance of VOCAYO. A total of 120 students were involved, with thirty drawn from each of four schools—SMAN 1, SMAN 2, SMAN 4, and SMAN 8 Takengon. As the primary end-users, these students represented the learner demographic most directly affected by vocabulary challenges and most likely to benefit from a digital intervention. Twelve

English teachers were purposively chosen, with three teachers representing each participating school. The teachers were eligible to participate because they were actively teaching English at the selected schools, were directly involved in implementing the senior high school English curriculum, possessed first-hand knowledge of students' vocabulary-learning difficulties, and were willing to participate in the questionnaires, interviews, and focus group discussions. The equal allocation of three teachers from each school was intended to ensure balanced institutional representation and to capture variations in instructional practices across the four school contexts.

To capture workplace demands, nine local tourism practitioners were included, consisting of three tour guides, three homestay operators, and three small business owners. Their contributions were vital in identifying authentic communicative situations within the tourism sector, ensuring that the vocabulary incorporated into VOCAYO was ecologically valid and directly applicable to real-world interactions. This triangulation of perspectives from students, teachers, and practitioners provided a balanced foundation for the development of the application.

Research Setting

The study was conducted in Takengon, Central Aceh Regency, Indonesia, a highland region noted for Lake Lut Tawar and its coffee plantations, both of which form the backbone of the local tourism economy. The site was chosen because of its dual relevance: it is a locus of English language learning at the high school level and simultaneously a living laboratory of tourism-based communicative needs. Conducting the study in Takengon guaranteed that the data collected was not only academically valid but also economically and socially meaningful.

Instruments and Data Collection

The research was structured around six key phases of the Dick and Carey model, each of which employing specific instruments to ensure systematic development and validation of VOCAYO. In the first phase, instructional goals were identified through questionnaires distributed to students and teachers, alongside semi-structured interviews with teachers and tourism practitioners. The questionnaires addressed several issues such as the frequency of English use, the perceived need for contextual vocabulary, students' interest in digital media, and access to technological facilities, while the interviews explored authentic communicative situations in tourism, language challenges, and the misalignment between school materials and workplace demands. The second phase, instructional analysis, utilized document analysis, curriculum review, and focus group discussions (FGDs), guided by a rubric to evaluate vocabulary relevance, sentence structures, instructional objectives, and competency standards, thereby ensuring that selected vocabulary was both curriculum-based and workplace-relevant. The third phase focused on learner and context analysis, where a rubric with three evaluative criteria including student motivation, technological access, and school infrastructure, was applied to assess readiness and constraints for implementing VOCAYO. In the fourth phase, learning objectives were formulated using aggregated data from all stakeholders, evaluated against six criteria: specificity, measurability, relevance, alignment with needs, flexibility, and integration. The fifth phase concentrated on the development of assessment instruments, with rubrics designed to guarantee objectivity, usability for teachers, and fairness in evaluation, ensuring rigorous assessment of learner progress and application effectiveness.

Later, the low-fidelity prototype was reviewed by three experts who were purposively selected based on their relevant academic and professional expertise. The expert panel consisted of one English language teaching expert, one instructional design expert, and one educational technology expert. Each expert evaluated the prototype using a five-point validation rubric covering five dimensions: content relevance, instructional alignment, language clarity, interface and navigation, and assessment integration. In addition to the numerical ratings, the experts provided written comments and recommendations for revising the content, instructional flow, visual presentation, and assessment features of VOCAYo.

Finally, a low-fidelity prototype was developed using Canva, covering layout, navigation, and sample content. Expert feedback was incorporated at this stage to refine the design and instructional flow before moving toward pilot testing, ensuring that the prototype was pedagogically sound, user-friendly, and contextually relevant.

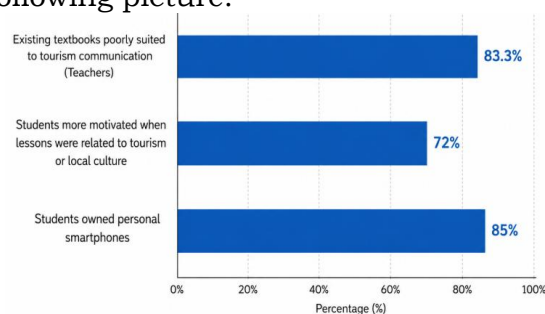
Data Analysis

The study employed a mixed-methods analytical framework that integrated both quantitative and qualitative approaches to capture a comprehensive picture of learner needs and instructional requirements (Dick et al., 2009). Quantitative data were drawn from rubrics, questionnaires, and instructional analyses, which were counted for descriptive statistics such as means, modes, and frequency distributions, to identify patterns in learner needs, curriculum alignment, and contextual readiness. Complementing this, qualitative data from interviews, focus group discussions, and open-ended survey responses underwent thematic analysis, where transcripts were coded, categorized, and grouped into themes such as

communicative demands, instructional challenges, learner motivation, and digital readiness. This process followed Braun and Clarke's (2006) guidelines to enhance credibility and trustworthiness. Triangulation across data sources from students, teachers, and tourism practitioners was then conducted to validate results and reduce potential bias, ensuring that findings reflected multiple perspectives rather than a single viewpoint. The integration of qualitative and quantitative outcomes provided a richer and more nuanced understanding of both the instructional design requirements and the expectations of end users. Through this combined approach, the design of VOCAYO was made not only theoretically sound but also empirically grounded in the lived realities of learners, educators, and local tourism practitioners.

RESULTS AND DISCUSSION

The results of the needs analysis highlight a clear gap between current English instruction and the linguistic demands of Takengon's tourism sector. The summary can be seen in the following picture.



Picture 1. Summary of quantitative data

Figure 1 above presents three quantitative findings obtained from the needs analysis. First, 83.3% of the participating teachers, representing 10 of the 12 teachers, reported that the existing English textbooks were poorly suited to preparing students for tourism-related communication in authentic settings. The teachers explained that the available materials were generally dominated by generic

topics and vocabulary memorization, with limited opportunities for students to practise language used in guiding tourists, describing local attractions, providing hospitality services, or tourism-related transactions.

The student data also indicated considerable readiness for tourism-based digital learning. 72% of the students showed greater motivation when English lessons were connected to tourism or local culture. This finding suggests that locally relevant topics, such as *Lake Lut Tawar*, *Gayo coffee*, local traditions, and tourism services, may increase students' engagement by making vocabulary learning more meaningful and applicable to their surroundings. Meanwhile, 85% of the students indicated owning personal smartphones, meaning that most participants had access to the primary device required for mobile-assisted language learning.

In brief, these findings supported the development of VOCAYO as a contextualized, mobile-friendly, and offline-capable vocabulary learning application. The strong level of smartphone ownership demonstrated the technological feasibility of the application, while students' motivation toward tourism-related content confirmed the importance of integrating local communicative contexts. The teachers' responses further reinforced the need for supplementary instructional media that could connect classroom learning with the authentic vocabulary demands of Takengon's tourism sector.

The expert feedback further supported the relationship between the needs-analysis findings and the design of the VOCAYO prototype. The highest validation score was obtained for content relevance, confirming that the integration of local attractions, Gayo culture, hospitality services, and tourism transactions was appropriate for the intended learners. This result strengthened the decision to organize the application around locally situated

communicative scenarios rather than generic vocabulary categories.

At the same time, the experts identified practical aspects requiring improvement. Their recommendations concerning navigation, instructional clarity, audio support, corrective feedback, and progress monitoring showed that relevant content alone was insufficient to ensure an effective digital learning experience. Therefore, the prototype was revised not only to reflect the linguistic needs identified by students, teachers, and tourism practitioners but also to improve its instructional coherence and user accessibility. However, these expert judgments represent an initial validation of the prototype and should not be interpreted as evidence of its effectiveness in improving students' vocabulary mastery.

Qualitative findings from teacher interviews and rubric-based evaluations provided additional support for the quantitative results. Students were generally able to use basic conversational expressions, including greetings, introductions, and simple transactional phrases. However, they experienced greater difficulty when using situational and descriptive vocabulary, particularly when giving directions, explaining local traditions, describing tourist attractions, or presenting local products such as Gayo coffee and handicrafts. These limitations further informed the selection of vocabulary content, communicative scenarios, and interactive activities incorporated into the VOCAYO prototype.

More detailed information can be seen in the following table.

Table 1. Needs Analysis from Teachers and Tourism Practitioners

Focus Area	Key Findings	Implications for VOCAYO
Communicative situations in local tourism	Practitioners often guide tourists, describe Lake	App content must include scenario-

	Lut Tawar, explain Gayo traditions, and present coffee production.	based vocabulary for guiding, describing, and cultural narration.
Skills most needed in the field	Hospitality (welcoming, serving, handling requests) and transactional skills (explaining prices, bargaining).	Integrate hospitality and service-related vocabulary modules.
Challenges in English use with tourists	Frequent reliance on gestures or translation apps due to lack of vocabulary.	Provide practical phrases to support fluency in common scenarios.
Alignment of school materials with workplace needs	Textbooks are too generic; little alignment with tourism communication.	Develop curriculum-linked yet tourism-specific content.
Expectations for contextual media	Teachers and practitioners want media that is digital, simple, and relevant to tourism.	Ensure VOCAYO is user-friendly, context-driven, and pedagogically sound.

Meanwhile, interviews with tour guides, homestay operators, and small business owners revealed recurring communicative situations that shaped the kind of English needed in Takengon's tourism sector. The data indicated three main clusters: guiding and describing, hospitality and service, and transactions. Tour guides frequently interacted with visitors by giving directions, explaining routes to Lake Lut Tawar, and narrating local traditions such as Gayo coffee cultivation. These encounters required descriptive vocabulary and the ability to provide extended explanations rather than short, formulaic

responses. Homestay operators, on the other hand, dealt with hospitality-related exchanges, including welcoming guests, explaining facilities, handling requests, and addressing complaints politely. Their communication emphasized service language, politeness markers, and cultural sensitivity. Small business owners engaged mostly in sales transactions, describing products, clarifying prices, and occasionally bargaining with tourists. While basic phrases were often used effectively, many practitioners admitted they lacked richer vocabulary to tell product stories, limiting the depth of cultural sharing.

In the following is provided the detailed table on the need analysis based on students' perspective.

Table 2. Needs Analysis from Students

Focus Area	Key Findings	Implications for VOCAYO
Frequency of English use	Students rarely use English outside classroom settings.	VOCAYO must extend opportunities for practice beyond school hours.
Topics most taught in school	Lessons focus on generic contexts (shopping, school routines) with minimal link to tourism.	Redesign materials with tourism themes (guiding, selling, serving).
Student needs for contextual materials	High demand for vocabulary tied to local attractions and tourism.	Include theme-based units on Takengon's tourism contexts.

Interest in digital media	Strong preference for interactive applications with visual and game-like features.	Add gamified elements and instant feedback to boost motivation.
Experience with interactive media	Limited prior exposure to digital learning tools.	VOCAYO should be intuitive and accessible for beginners.

In terms of the instructional analysis, it was conducted through document analysis, curriculum review, and focus group discussions (FGDs), highlighted a persistent discrepancy between existing materials and the communicative needs of Takengon tourism context. Using a rubric with four evaluative aspects covering vocabulary relevance, sentence structure, goal alignment, and competency suitability, the analysis showed significant gaps. Textbooks prioritized generic vocabulary such as “library,” “playground,” or “post office,” which scored low on relevance since they bore little relation to tourism. Sentence structures were similarly limited, consisting of rigid frames like “This is a pen” or “My school is big,” which, while functional for beginners, offered minimal scaffolding for guiding tourists, handling hospitality tasks, or conducting transactions.

Curriculum goals were broader, outlining basic communicative abilities but scoring only “moderate” in alignment because they lacked situational specificity; for instance, objectives such as “describing people and objects” did not extend to describing attractions or cultural practices. Competency review revealed a similar pattern: while general skills such as introductions and asking for information were included, essential tourism-oriented competencies were

absent. Teachers in FGDs confirmed that these shortcomings hindered authentic communication training despite their efforts to adapt materials creatively.

Building on the gaps revealed in the instructional analysis, the learner and context analysis further clarified the readiness of students and schools to adopt a digital medium such as VOCAYO. Using a rubric of three aspects such as student interest in learning English, access to technology, and the condition of school facilities with environmental support, the findings were mixed but encouraging. First, students demonstrated high motivation to learn English when it was tied to practical outcomes, with 72% indicating they were more eager to study when lessons related to tourism or local culture, confirming that relevance strongly drives engagement. Second, access to technology was generally adequate: approximately 85% of students reported owning personal smartphones, most of which ran on basic Android systems, though stable internet access remained inconsistent, especially in areas outside the town center. Third, the school facilities review suggested that while language classrooms were equipped with projectors and basic audio systems, there was limited provision of computer labs or institutional Wi-Fi, requiring reliance on students’ devices. Teachers in focus groups also noted that administrative support for digital integration was growing but uneven across schools. Overall, the analysis suggested that VOCAYO could be feasibly implemented, provided it remained lightweight, mobile-friendly, and capable of offline use.

Drawing from the identified needs of students, teachers, and tourism practitioners, the formulation of learning objectives focused on ensuring that the instructional goals for VOCAYO were both precise and practical. A rubric guided this phase, assessing objectives across six

dimensions: specificity, measurability, alignment with media design, relevance to needs analysis, implementation flexibility, and integration across goals. Results showed that most proposed objectives scored high on specificity and measurability, with clear statements such as “students are able to give directions to local attractions” or “students can describe Gayo coffee in English.” Alignment with media design was also strong, as objectives were structured to fit interactive digital tasks. However, flexibility and integration scored moderately, reflecting concerns about balancing curricular demands with local tourism contexts. Teachers emphasized that objectives should remain adaptable across classroom and extracurricular settings. Overall, the objectives provided a solid foundation for guiding VOCAYO’s development.

After the learning objectives were formulated (Phase 4), the next step (Phase 5) was to design instruments that could evaluate whether those objectives were being met. This stage went beyond simply drafting rubrics; it involved creating assessment tools that could measure learning outcomes in a way that was objective, easy for teachers to use, and free from bias. The rubric designed for this phase evaluated three core criteria:

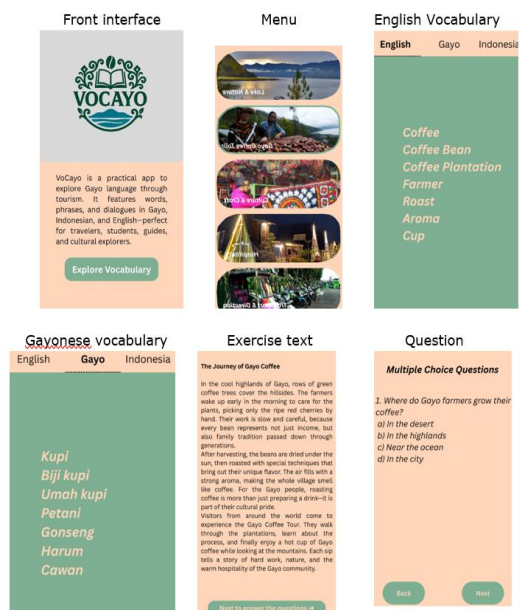
Table 3. Integration of Assessment Instruments in VOCAYO

Criterion	In-App Integration	Examples
Objectivity	Auto-scoring + rubric-based rating	MCQ, matching, fill-in, dictation; rubrics
Ease of Use	Simple teacher dashboard	Progress view, item bank,

Bias Control	Fair and consistent scoring	export, offline Randomized items, blind marking, accessibility, exemplars
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The table illustrates how the assessment instruments developed in Phase 5 were integrated into VOCAYO to ensure effective evaluation of learning objectives. Three key criteria guided this process: objectivity, ease of use, and bias control. Objectivity was achieved through auto-scoring features, such as multiple-choice, matching, fill-in-the-blank, and dictation tasks, combined with rubric-based ratings for open responses. Ease of use was addressed by providing a simple teacher dashboard that offered progress tracking, an item bank linked to learning objectives, export functions, and offline access. Bias control was ensured through features that promoted fair and consistent scoring, including randomized item order, blind marking, accessibility options, and exemplar-based calibration.

These elements established a reliable and teacher-friendly digital assessment system. Building upon these findings, the subsequent section presents the mock-up design of VOCAYO as the instructional product developed through this process.



Picture 2. VOCAYO Interface

The results of expert validation can be seen in the following picture.



Picture 3. Expert Validation of the VOCAYO Prototype

Expert validation provided additional evidence regarding the appropriateness of the VOCAYO prototype. Three experts evaluated the application across five dimensions using a five-point scale. As shown in the table, content relevance received the highest mean score of 4.67, indicating that the vocabulary topics, local tourism contexts, and communicative scenarios were considered highly relevant to the needs of EFL learners in Takengon. Instructional alignment and language clarity each obtained a mean score of 4.33, suggesting that the learning objectives, activities, and language used in the prototype were generally clear and appropriately connected.

Interface and navigation received a mean score of 4.00. Although the experts considered the prototype easy to understand, they recommended simplifying several navigation buttons, maintaining consistent icon placement, and providing clearer instructions for first-time users. Assessment integration also obtained a mean score of 4.00. The experts positively evaluated the inclusion of multiple-choice, matching, fill-in-the-blank, and dictation tasks but recommended adding immediate corrective feedback, clearer scoring information, and a progress summary for students and teachers.

The overall mean score was 4.27 out of 5, indicating that the prototype was considered highly appropriate for further development. Nevertheless, the experts recommended several revisions before pilot implementation. These revisions included simplifying the navigation system, improving the consistency of visual elements, shortening several instructional directions, adding audio models for selected vocabulary items, strengthening offline accessibility, and refining the progress-monitoring feature. The recommendations were subsequently incorporated into the revised prototype.

Discussion

This study revealed three interrelated issues: the English vocabulary needs and existing competencies of students and teachers, the communicative situations encountered by local tourism practitioners, and the translation of these needs into the design of VOCAYO. The findings consistently demonstrated a mismatch between generic school-based English materials and the vocabulary required for tourism communication in Takengon. This mismatch was reflected in teachers' evaluations of existing textbooks, students' limited situational vocabulary, and practitioners' descriptions of recurring communi-

cation in guiding, hospitality, and commercial transactions.

The results of the needs analysis clearly showed a mismatch between classroom instruction and the communicative realities of the tourism industry. Students consistently described their English lessons as too general and detached from the contexts they encountered in daily life. Lessons focused on themes such as shopping or school routines, which were only marginally relevant to the needs of engaging with foreign visitors. Instead, students expressed a pressing desire for contextualized vocabulary that would allow them to guide tourists, describe attractions such as Lake Lut Tawar, and promote local products like Gayo coffee. Their preference for digital and interactive learning also underscored the generational shift toward mobile-based solutions.

Teachers reinforced this perception, acknowledging that existing textbooks did little to prepare students for authentic communicative encounters. Ten of the twelve teachers surveyed reported that textbooks remained generic and over-reliant on memorization, which may help students succeed in tests but left them unprepared for spontaneous conversations with tourists. Both groups, therefore, converged on the urgent need for supplementary learning media that could link classroom content with workplace realities while remaining simple to integrate and equipped with assessment mechanisms.

Learner and context analysis, however, provided encouraging signs for the feasibility of VOCAYO. Students showed strong motivation when learning was linked to tourism and local culture, with 72% reporting higher interest in such lessons. Access to technology was also favorable: 85% of students owned smartphones, even though connectivity and school facilities remained inconsistent. Classrooms often had basic projectors

or audio equipment, but few had institutional Wi-Fi or computer labs, making reliance on personal devices necessary. Teachers noted that administrative support for digital integration was emerging but uneven.

All in all, these findings suggested that a mobile-friendly, lightweight, and offline-capable app would be both usable and welcomed by its intended audience. Based on these data, the formulation of instructional objectives focused on creating precise, measurable goals that could directly translate into app content. Rubric-based evaluations confirmed high scores for specificity and measurability, with objectives such as enabling students to give directions to attractions or describe Gayo coffee. Alignment with media design was also strong, as objectives were written to match interactive tasks. However, flexibility and integration across contexts scored moderately, reflecting teachers' concerns about balancing curriculum requirements with localized needs. Despite these limitations, the objectives provided a solid framework for app development.

The final stage of assessment instrument design emphasized reliability and usability. Rather than relying solely on rubrics, the instruments incorporated auto-scoring features for tasks like multiple-choice, matching, fill-in-the-blank, and dictation, alongside rubric-based ratings for open responses. The system was further enhanced by a simple teacher dashboard offering progress tracking, an item bank linked to objectives, data export, and offline functionality. Bias control was also addressed through randomized item orders, blind scoring, accessibility settings, and exemplar-based calibration. These features ensured that assessments would not only measure learning outcomes effectively but also support teachers in integrating the app into classroom practice. These findings align with and

extend existing literature on mobile-assisted language learning (MALL).

The findings directly informed the design specifications of VOCAYO. Vocabulary content was organized around guiding and describing, hospitality and service, and transactional communication. The high level of smartphone ownership supported a mobile-based format, whereas uneven internet access justified the inclusion of offline functionality. Interactive exercises and embedded assessments were incorporated as design responses to students' preference for engaging media and teachers' need for manageable progress monitoring. These features represent design decisions derived from the needs analysis; their effectiveness has not yet been established through experimental or field testing.

These findings are consistent with Azar and Nasiri (2014), who reported that mobile-based vocabulary activities supported learner autonomy and vocabulary retention; Chen and Hsu (2020), who found that gamified vocabulary applications enhanced learner motivation; and Fitriani et al. (2019), who reported improvements in short-term vocabulary recall through Quizlet. However, the present study differs from these studies by deriving its vocabulary content from the specific communicative demands of Takengon's tourism sector. Consequently, the VOCAYO prototype prioritizes three locally relevant communicative domains: guiding and describing, hospitality and service, and tourism-related transactions.

The results illustrate challenges similar to those identified in other Indonesian contexts, where rote learning and test preparation often dominate classrooms at the expense of communicative competence (Arimbawa et al., 2024). Yet, unlike urban learners who may require academic English, rural learners in Takengon need descriptive, service-oriented, and narrative language directly tied to tourism. This distinction underscores

the importance of localized needs analysis in EdTech design.

Furthermore, by embedding objectivity, ease of use, and fairness into its assessment system, VOCAYO addresses one of the persistent weaknesses of digital tools the absence of reliable and teacher-friendly evaluation methods (Ismail, 2017). In short, the discussion highlights that the gap between classroom English and tourism communication in Takengon is wide but bridgeable (Rahmadani et al., 2024). Students and teachers alike recognize the need for localized, digital solutions, and the feasibility of such interventions is supported by both learner motivation and technological access (Nurhayati & Suryaman, 2024). VOCAYO's design, grounded in empirical evidence and contextual relevance, represents a novel contribution not only to vocabulary instruction (Syahputri, Ismail, & Darsan, 2024) but also to the broader field of mobile learning in specific socio-economic domains.

CONCLUSION

This study found that English instruction in the four participating schools did not adequately address the vocabulary required for tourism communication in Takengon. Ten of the twelve teachers (83.3%) considered existing textbooks poorly aligned with authentic tourism interactions. Student data also indicated greater motivation for tourism- and culture-related learning, while 85% of the students had access to personal smartphones. Data from tourism practitioners identified three priority communicative domains: guiding and describing, hospitality and service, and transactions. These findings informed the development of VOCAYO as a localized, mobile-friendly, and offline-capable vocabulary-learning prototype incorporating scenario-based content, interactive activities, and embedded assessment features. Thus, the study addressed its research problem by translating identified learner, curri-

cular, and workplace needs into a context-specific application design. Because VOCAYO remained at the prototype stage, the present study did not establish its effectiveness in improving vocabulary mastery, motivation, or autonomous learning. Subsequent research should therefore conduct expert validation, usability testing, pilot implementation, and field evaluation to determine the application's learning effectiveness.

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