

INNOVATION IN LANGUAGE AND CULTURE PRESERVATION THROUGH THE DEVELOPMENT OF A TRILINGUAL DIGITAL DICTIONARY: BATAK TOBA – INDONESIAN – ENGLISH

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ABSTRACT

Language is a vital part of human culture and reflects the identity of a community. Over time, many regional languages face extinction due to a decline in native speakers. One such language is Batak Toba. Its use is decreasing among younger generations because of factors like migration, inter-ethnic marriages, and the growing dominance of Indonesian and foreign languages. If this trend continues, Batak Toba may disappear in the coming generations. This study aims to preserve the Batak Toba language and culture by developing a Trilingual Digital Dictionary (Batak Toba–Indonesian–English). The instructional development process adheres to the 4-D model framework, encompassing the stages of definition, design, development, and dissemination. The resulting dictionary undergoes rigorous evaluation to determine its validity, practicality, and overall effectiveness. The research starts with several analyses: front-end, student, language, task, concept, and goal setting. Then, research instruments are created, media and formats are selected, and an initial prototype is developed. This first version is validated by experts, revised, and tested in classroom settings. Data from these evaluations are analyzed to determine whether the product meets quality standards. The result is a final version of the digital dictionary that is proven to be valid, practical, and effective for language preservation.

Keywords: Batak-Indonesian-English, Cultural Preservation, Language Preservation, Research and Development, Trilingual Digital Dictionary

INTRODUCTION

Language is one of the essential elements of human culture. In addition to functioning as a means of communication, language also serves as the identity of a community group. However, with the progression of time, many regional languages are endangered due to the decreasing number of active speakers. One such language is Batak Toba.

According to Ethnologue (2021), the Batak Toba language is spoken by around 2 million people, primarily in North Sumatra, Indonesia. However, its use is declining among the younger generation due to various factors such as migration, inter-ethnic marriages, and the influence of Indonesian and foreign languages (Sibarani, 2018; Brenzinger et al., 2003). Empirical studies have shown that members of the younger generation within the Batak

Toba community engage minimally in the use of the Batak Toba language during social interactions, a pattern that contrasts markedly with that of the older generation (Marpaung & Tampubolon, 2022; E. P. Simamora et al., 2025; Sinaga, 2019). This phenomenon suggests a lack of awareness among the youth regarding the significance of preserving their linguistic and cultural heritage. The Batak Toba language, as a mother tongue, is frequently perceived as having lower sociolinguistic prestige in comparison to the national language, Indonesian, or to foreign languages, thereby contributing to a decreased motivation to acquire, use, and sustain the language.

Academic research on the Batak Toba language is still limited, resulting in a lack of references and data that can be used in the development of learning materials and translation tools. Information on the Batak Toba language-particularly in terms of its structure, linguistic components, and other relevant aspects-remains limited or poorly coordinated in documentation, making it difficult for researchers and learners to access and utilize. The lack of well-organized and accessible resources constitutes a major obstacle to efforts aimed at the preservation and learning of the language (Pasaribu, 2021; N. J. Simamora et al., 2022). Numerous speakers of the Batak Toba language have reported a significant lack of accessible learning resources to support the study of their own language, particularly in digital formats that align with contemporary technological use. Simanjuntak et al. (2022) emphasize the importance of local wisdom in everyday communication, their study does not specifically address the availability or development of digital educational materials for the Batak Toba language. Recent initiatives aimed at digitalizing cultural learning resources relevant to the Batak Toba community have primarily concentrated on traditional decorative arts, with limited attention given to the linguistic dimension of the language itself (Azis et al., 2023). The existing resources are often not easily accessible to the general public, especially the younger generation who are more accustomed to digital technology.

The lack of adequate tools for translating the Batak Toba language into Indonesian and English, and vice versa, presents a challenge in cross-linguistic communication. In the context of globalization, the ability to communicate in multiple languages is becoming increasingly important, including for the Batak Toba community, which is spread across various countries (Nababan, 1991).

The development of technology for minority languages is often neglected, resulting in inadequate digital tools that do not optimally meet users' needs. Investment in the development of digital technology for the Batak Toba language, including digital dictionaries, remains very limited (Calvin et al., 2025; Silalahi et al., 2024).

If this trend continues, it is feared that the Batak Toba language could become extinct within the next few generations. To preserve the Batak Toba language, various efforts are needed, one of which is through the development of a dictionary. A dictionary serves a crucial function in preserving and standardizing a language's lexicon, including word meanings, pronunciations, and usage. (Pusat Pengembangan dan Pelindungan Bahasa dan Sastra, 2021; Svensen, 2009). In the current digital era, electronic/digital dictionaries offer several advantages over printed ones, such as practicality, portability, multimedia features, ease of

updates, and accessibility (Hasan & Iribaram, 2022; Lew, 2010; Nesi, 2009; E. P. Simamora et al., 2025).

Digital dictionaries also allow for the addition of more than one language (multilingual). This is beneficial for foreign language learning and translation (Prinsloo, 2012). Compared to bilingual dictionaries, trilingual dictionaries can provide a more comprehensive understanding by pairing words from three languages simultaneously (Guo, 2004). Thus, the development of a Batak Toba - Indonesian - English trilingual digital dictionary is a promising innovation.

In addition to preserving the language, such a dictionary can also document the Batak Toba culture. As is known, language and culture are two interconnected aspects. Language expresses, embodies, and symbolizes cultural realities (Kramsch, 2015). By incorporating cultural terms specific to Batak Toba, such as kinship, traditional ceremonies, traditional music, etc., into the digital dictionary, these invaluable heritages can be passed down to future generations.

The development of the Batak Toba - Indonesian - English trilingual digital dictionary needs to be carried out meticulously by involving linguists, cultural experts, IT specialists, and relevant stakeholders. The dictionary content must be accurate, comprehensive, up-to-date, and user-friendly. The interface design and features should also be engaging and user-friendly. With careful planning and proper implementation, this dictionary could be an innovative solution for preserving the Batak Toba language and culture in the digital era.

METHODS

The instructional development process adheres to the 4-D model framework, encompassing the stages of definition, design, development, and dissemination (Thiagarajan et al., 1974). This study involves the development of a trilingual digital dictionary-Batak Toba, Indonesian, and English-as an innovative initiative aimed at preserving the linguistic and cultural heritage of the Batak Toba community. The quality criteria for the Batak Toba-Indonesian-English trilingual digital dictionary as the product of this development research refer to the product quality criteria by Nieveen (1999: 125-135), which emphasizes three core aspects: validity, practicality, and effectiveness (Simanullang, 2018).

This research is being conducted at SD Negeri 173449 Hutajulu, Onan Ganjang district, Humbang Hasundutan regency, during the 2024/2025 academic year, involving 30 students from grades 4, 5, and 6. The research instruments used in this study include: 1) a validation sheet for the Batak Toba-Indonesian-English trilingual digital dictionary and a validation sheet for the learning outcome test; 2) assessment sheets and observation sheets for the practicality of using the Batak Toba-Indonesian-English trilingual digital dictionary; and 3) an effectiveness assessment sheet for the use of the Batak Toba-Indonesian-English trilingual digital dictionary, learning outcome tests, and student response questionnaires.

The research process commences with a series of preliminary analyses, including front-end analysis, learner characteristics analysis, language analysis, task analysis, concept analysis, and the formulation of specific research objectives. Following these steps, the study proceeds with the development of research instruments, the selection of appropriate media and formats, and the initial design of the Batak Toba-Indonesian-English Trilingual Digital

Dictionary (hereafter referred to as Prototype 1). Prototype 1 undergoes a process of validation, refinement, and field testing. Subsequently, the analysis of expert feedback and classroom data is performed to assess the validity, practicality, and effectiveness of the Batak Toba–Indonesian–English Trilingual Digital Dictionary. This process culminates in the creation of a final prototype that meets the criteria for validity, practicality, and effectiveness.

RESULTS

The outcome of this developmental study is a Batak Toba–Indonesian–English trilingual digital dictionary that meets the criteria of validity, practicality, and effectiveness. The collected data are systematically divided into two main categories, reflecting the consistency between assessment data and observational findings.

Validity of the Batak Toba–Indonesian–English Trilingual Digital Dictionary

The validation process for the Batak Toba–Indonesian–English trilingual digital dictionary was conducted after the design of the dictionary was completed. This process involved three experts, including one lecturer from the Engineering and Graphic Multimedia Study Program, one English lecturer from Medan State Polytechnic, and one expert in Batak Toba language and culture who is a direct speaker and elder (penetua) of the Batak Toba tribe in Onan Ganjang district, Humbang Hasundutan. The experts evaluated the Batak Toba–Indonesian–English trilingual digital dictionary and the Learning Outcome Test during the validation phase. They conducted this validation prior to the classroom trial in the experimental class. Figure 1 illustrates the results of the validation data.

As depicted in Figure 1, the Batak Toba–Indonesian–English trilingual digital dictionary achieved mean validity scores of 4.47, 4.52, and 4.57 for the format, language, and content aspects, respectively. Consequently, the overall average validity rating of the dictionary stands at 4.52. Based on the predetermined evaluation standards, these results affirm that the dictionary fulfills the criteria for validity. This indicates that the developed trilingual digital dictionary possesses adequate validity. Similarly, the Learning Outcome Test received validity scores of 4.53, 4.57, and 4.67 across the same aspects, yielding an overall mean validity score of 4.59. This score similarly categorizes the Learning Outcome Test as valid.

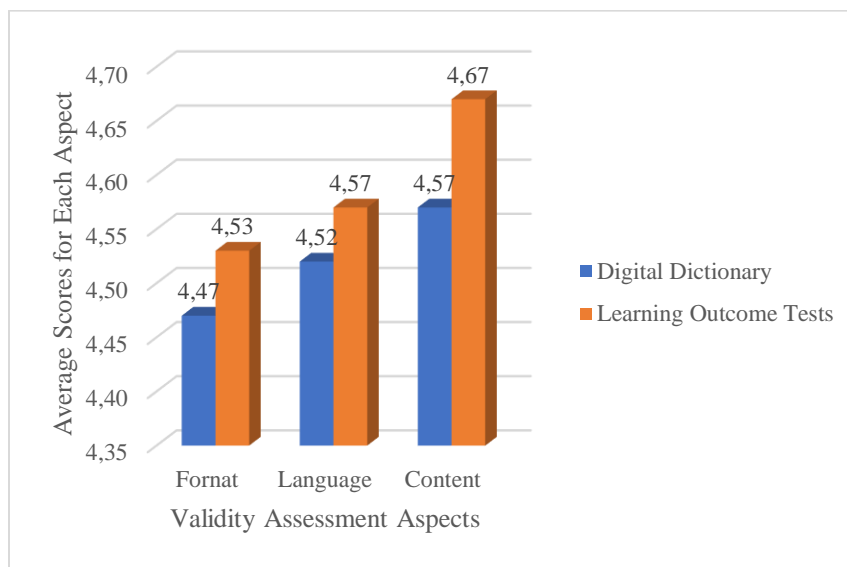


Figure 1. Validity Data of the Batak Toba–Indonesian–English Trilingual Digital Dictionary and Learning Outcome Test

Practicality of Using the Batak Toba–Indonesian–English Trilingual Digital Dictionary

The practicality of utilizing the Batak Toba–Indonesian–English trilingual digital dictionary was determined by analyzing the consistency between two sets of assessments: expert assessments conducted prior to classroom implementation and observer assessments carried out during the actual classroom use. The pre-implementation expert assessments involved three specialists who, drawing upon their theoretical expertise and practical experience, assessed the instructional practicality of the developed digital dictionary. Meanwhile, the observer assessments were performed during the classroom trial phase to monitor the dictionary’s application in a real learning environment. The assessment was carried out while the digital dictionary was implemented in the classroom by observing the learning process using the developed Batak Toba–Indonesian–English trilingual digital dictionary. This classroom trial activity was conducted once in three experimental classes. The practicality data for the developed Batak Toba–Indonesian–English trilingual digital dictionary are presented in a diagram in Figure 2.

Figure 2 presents the theoretical practicality scores of the Batak Toba–Indonesian–English trilingual digital dictionary, assessed across the aspects of syntax, social system, and principles of reaction and management, with average scores of 4.62, 4.47, and 4.40, respectively. These results yield an overall theoretical practicality score of 4.50. According to the predetermined evaluation criteria, this indicates that, based on expert assessment, the dictionary’s practical application is categorized as high. Similarly, the overall practicality score obtained from the classroom trial is 4.13, which also classifies the practical use of the Batak Toba–Indonesian–English trilingual digital dictionary as high based on classroom implementation data.

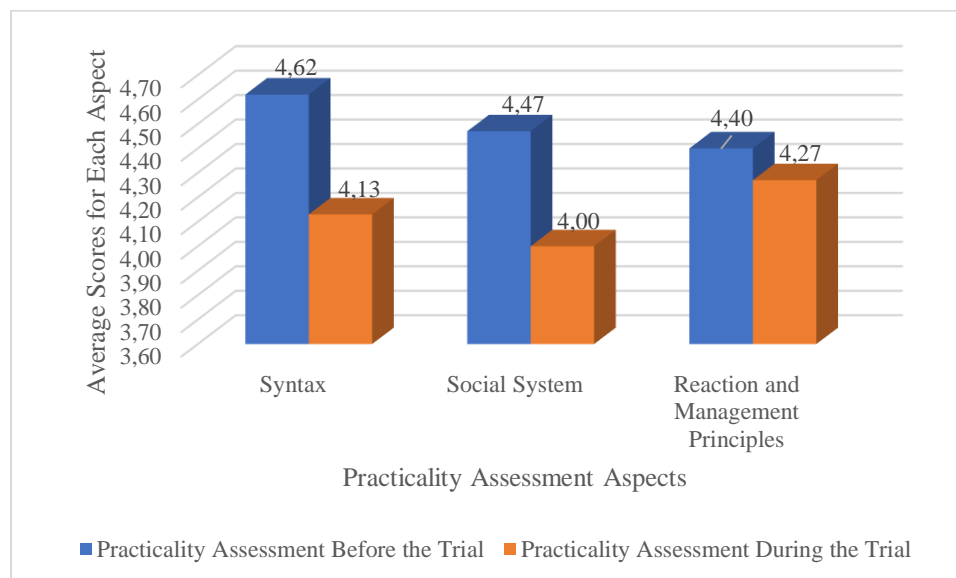


Figure 2. Practicality Data of the Batak Toba–Indonesian–English Trilingual Digital Dictionary

Effectiveness of Using the Batak Toba–Indonesian–English Trilingual Digital Dictionary

The effectiveness of the Batak Toba–Indonesian–English trilingual digital dictionary is determined by examining the alignment between two key sources of assessment: expert assessments conducted prior to classroom trial and the extent to which effectiveness indicators were achieved during the classroom trial. Three subject-matter experts carried out the initial evaluation, drawing on their theoretical expertise and professional experience to assess the potential effectiveness of the digital dictionary in an instructional setting.

The effectiveness assessment of using the Batak Toba–Indonesian–English trilingual digital dictionary is reviewed from three aspects: student learning outcomes, learning time usage, and student responses, with averages of 4.33, 4.44, and 4.56, respectively. Thus, the overall average theoretical effectiveness score of the Batak Toba–Indonesian–English trilingual digital dictionary is 4.44 (see Table 1). Based on the established assessment criteria, it can be concluded that the effectiveness of using the Batak Toba–Indonesian–English trilingual digital dictionary based on expert assessment is classified as high.

The classroom trial was conducted once across three experimental classes. The effectiveness data related to the Batak Toba–Indonesian–English trilingual digital dictionary are summarized in Table 1. As shown in the table, the average post-test score for student learning outcomes during the trial was 86.01. Based on established evaluation criteria, this score is categorized as high. The improvement in student performance was further examined by calculating the normalized gain score, which averaged 0.60–falling within the moderate improvement category. This suggests that the observed learning gains align with expected outcomes. Additionally, the average student response score reached 86.10%, exceeding the 80% threshold, thereby indicating that the use of the digital dictionary during classroom implementation effectively met the targeted research benchmarks.

Table 1. Effectiveness Data of the Batak Toba–Indonesian–English Trilingual Digital Dictionary

Aspects Being Assessed	Student Learning Outcomes	Use of Learning Time	Student Responses
Effectiveness Assessment Before Trials	4.33 (max 5)	4.44 (max 5)	4.56 (max 5)
Effectiveness Assessment During Trials	Pre = 64.98 (max 100) Post = 86.01 (max 100)	4.33 (max 5)	86.10 (max 100)

In reference to the validation results illustrated in Figure 1, the practicality assessments outlined in Figure 2, and the effectiveness metrics presented in Table 1, it can be inferred that the Batak Toba–Indonesian–English trilingual digital dictionary developed through this study satisfactorily meets the comprehensive criteria of validity, practicality, and effectiveness, thereby demonstrating its appropriateness for implementation in educational contexts.

DISCUSSION

The product of this development research is a trilingual digital dictionary of Batak Toba–Indonesian–English that meets the criteria of validity, practicality, and effectiveness. The developed digital dictionary offers universal accessibility, enabling users to access it anytime and from any location. The digitization of language represents a strategic effort to preserve linguistic and cultural heritage by providing easier access for all individuals, particularly the younger generation, to engage with their native language and culture. This approach promotes cultural continuity while simultaneously allowing openness to global cultural influences (Aji et al., 2022; Amelia et al., 2024; Nanduri & Bonsignore, 2023). This allows the younger generation to learn the Batak Toba language more easily. This dictionary can be used as teaching material in schools, covering not only Indonesian–English but also Batak Toba as an effort to preserve the language among students (Muawanah et al., 2024; Septiyana & Hastomo, 2023).

The use of the Batak Toba–Indonesian–English trilingual digital dictionary in the classroom requires adequate resources, such as internet availability, digital devices, etc. The resources needed to develop and maintain digital applications often become obstacles and require attention or support from relevant stakeholders (Hairah et al., 2023; Oliviatika et al., 2024).

The results of this study indicate that the use of the Batak Toba–Indonesian–English trilingual digital dictionary developed in this research received positive responses from students during classroom trials. It is important to note that in utilizing technology as an effort to preserve local languages and cultures, it is necessary to develop attractive and user-friendly features so that users (students) do not feel burdened while learning.

CONCLUSION

Based on the previously discussed research findings, the conclusions of this development study can be summarized as follows. First, the trilingual digital dictionary of Batak Toba–Indonesian–English that was developed has been categorized as valid. Second,

the practicality of this digital dictionary was evaluated from two perspectives: (1) expert assessments based on theoretical knowledge and professional experience, and (2) classroom trials. The latter showed that the dictionary met high criteria in terms of syntax, social system, as well as the principles of reaction and management. Third, the effectiveness of the digital dictionary was also determined through expert evaluation, which indicated a high level of effectiveness, and through classroom implementation. The classroom trial data demonstrated high student learning outcomes, with an average score of 86.01, a high average score for time efficiency in learning at 4.33, and a positive response rate of 86.10% from students regarding the use of the trilingual digital dictionary. These results collectively confirm the dictionary's validity, practicality, and effectiveness in supporting language learning.

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