Preserving and Nurturing Tausug Language: The Bahasa Sug Mobile Learning Application Tool for Enhancing Mother Tongue Development for Toddlers

Shernahar K. Tahil , **Jonel T. Alibasa** , **Shamier – Rahman K. Tahil** , **Jeanor Marsin**
College of Computer Studies
Mindanao State University – Sulu, Philippines

Shanaia – Shedri K. Tahil
College of Arts and Science
Mindanao State University – Sulu, Philippines

Abstract. In the fast-paced modern world, English and other commonly spoken languages have become prevalent even in Tausug households. This shift towards these languages presents difficulties in preserving and advancing the Tausug language. Therefore, it is essential to discover effective methods to cultivate language foundations and encourage the development of the mother tongue among Tausug toddlers. One hundred and sixty toddlers and 160 parents from eight Barangay in Jolo, Sulu, participated in a study. It was to investigate the effect between Bahasa Sug Mobile Learning Applications and traditional teaching methods in enhancing mother tongue development for toddlers. The results indicated high significance in favor of the Bahasa Sug Mobile Learning Application over the traditional teaching method, as shown by a t-test with a p-value of 0.05. The parents noted Bahasa Sug Mobile Apps' significant value in increasing their children's learning. Bahasa Sug, mobile learning applications, have become valuable tools for nurturing and preserving mother tongues in toddlers. These applications provide engaging and interactive experiences that align with children's natural learning processes. They can create an immersive and interactive environment for toddlers to develop and preserve their mother tongue. By embracing this mobile learning application, it can ensure the continuity and vitality of native languages, allowing children to maintain a strong connection with their cultural heritage and linguistic identity.

Keywords: Tausug Language; Bahasa Sug; Mobile Learning Application; Mother Tongue; Cultural Identity; Child Development

1. Background of the Study

There has been no previous study regarding Preserving and Nurturing Tausug Language. The Tausug people are an indigenous Muslim group residing in the Sulu Archipelago of the southern Philippines (Britannica, 2016), particularly in East Mindanao (Jubilado et al., 2015). They have a distinct culture and language called Bahasa Sug, their primary means of communication. The term "Bahasa Sug" is derived from "Bahasa," which means "language" in many Asian languages, and "Sug," which can refer to "Sulu" or "current." According to Cowie (1893), all natives of Sulu and Tawi-Tawi spoke the Sulu Language or Bahasa Sug. It is appropriate to refer to the language spoken by the people of Sulu as Bahasa Sug (Bangahan, 2015). To uphold the cultural heritage of the Tausug tribe, it is vital to conserve and foster their unique language as the role of language in preserving cultural identity and nurturing language roots among communities is critical: for many communities, their mother tongue is vital to their heritage, traditions, and collective memory.

It is important to encourage the use of one's native language as research suggests it positively impacts cognitive development. Studies have demonstrated that proficiency in one's mother tongue can also improve language learning ability. Scientific evidence indicates that children who are skilled in their native language are more likely to exhibit superior cognitive skills such as critical thinking, problem-solving, and memory retention. Using one's native language for self-expression helps in expressing thoughts, emotions, and experiences more effectively, leading to enhanced cognitive development.

Piaget's (1971) cognitive development theory states that children undergo different stages of cognitive growth, each with unique characteristics. This theory places significant emphasis on providing toddlers with a supportive and intellectually stimulating learning environment, enabling them to engage in language acquisition actively. The use of mobile learning applications provides youngsters with the opportunity to leverage their innate strengths, promoting cognitive progress and supporting the enhancement of their linguistic aptitude. The acquisition of language and literacy abilities in children starts before their preschool enrollment and factors such as ethnicity, home language, and parental education are crucial in shaping their abilities. Numerous studies have demonstrated that, when children receive education in their native language, they exhibit enhanced language proficiency, expanded vocabulary, and improved literacy competencies (Grunewald, 2016). Recognizing the significance of using language children are most comfortable and familiar with is crucial, as it greatly enhances their understanding, communication, and engagement in the educational process.

Vygotsky's (1978) sociocultural theory emphasizes social interactions and cultural environment in language development. Children learn by actively participating in social interactions and collaborating with experts like parents, teachers, and peers. Mobile learning apps like Lingokids use Vygotsky's theory to encourage parent-child language acquisition through interactive activities. The sociocultural method fosters language development by creating a

supportive and participatory environment that mimics children's normal social interactions.

Likewise, Skinner (1963) emphasizes the role of reinforcement and rewards in shaping behavior. According to him, the infant replicates the linguistic patterns exhibited by their parents and those in their immediate environment. When an adult acknowledges a child's words, they frequently praise them, encouraging positive reinforcement. Language learning tools such as Rosetta Stone Kids Lingo Word Builder employ behaviorist ideas by offering positive reinforcement and rewards to young children as they interact with their native language. These apps use visual cues, games, and interactive exercises to reinforce correct language usage and encourage continuous practice. With these techniques, toddlers are motivated to actively participate in language learning, leading to improved retention and proficiency in their mother tongue.

The popularity of mobile learning has witnessed a significant rise owing to the widespread adoption of smartphones and other personal devices and, as such, utilizing mobile devices in personalized learning has emerged as an ongoing trend, one which presents innovative possibilities for the advancement and promotion of language acquisition and is increasingly gaining recognition worldwide. Using language learning applications for mother tongue development has now proven advantageous. Firstly, these apps offer a personalized and engaging learning experience tailored to toddlers' needs and preferences. The interactive features, visual aids, and gamification elements keep children motivated and enthusiastic about learning their mother tongue. Secondly, language learning apps provide a convenient and accessible platform, allowing toddlers to learn at their own pace, whenever and wherever they like. This flexibility enables consistent exposure to the mother tongue, facilitating a deep and lasting connection to their cultural heritage. Finally, language learning apps foster a positive and nurturing environment, promoting self-confidence and pride in one's cultural identity. By preserving and nurturing the mother tongue, these apps empower toddlers to embrace their linguistic heritage and actively contribute to preserving their cultural diversity (Konstantakis et al., 2022).

Research has indicated that a child's mother tongue plays a significant role in their educational success. Studies indicate that students taught in their original language will likely have superior academic performance, higher literacy rates, and enhanced learning outcomes (Benson & Kosonen, 2013). A study conducted by UNESCO in 2016 suggests that teaching young children in their mother tongue as the primary language can aid in their understanding of concepts and facilitate learning other languages later on.

Mother Tongue refers to one's original language, representing culture and identity. A child's mother tongue is the first language they learn and often consider their native language. Learning in our mother tongue is essential as it improves cognitive skills, helps us acquire a second language, and develops our literacy abilities. Using one's native language also contributes to language and literacy skills. Research indicates that a firm understanding of one's native language can facilitate the acquisition of other languages (UNESCO, 2016).

Although the English language holds significant global importance and is regarded as a fundamental aspect of human existence (Abidin, 2012), and has gained prominence over native languages in numerous countries (Rao, 2019), including Tausug households, native languages or mother tongue should still play an essential role in early child development. Teaching children in their mother tongue during their early years can improve their language skills, cognitive development, and emotional stability. Feldman (2019) links good long-term results in school, work, and social life to a solid base in language skills. It impacts familial and social relationships, personal identity, the socioeconomic world, cognitive abilities, and academic success (Triebold, 2020). Facilitating toddlers' learning process can improve through effective mother tongue communication between parents and teachers. This approach has consistently resulted in positive outcomes, increasing achievement and success for these young learners. Collaboration fosters the creation of a conducive and intellectually stimulating environment.

Furthermore, preserving a child's native language can help build a positive self-image, boost confidence, and encourage cultural appreciation among young children. Retaining their linguistic heritage helps children feel more connected to their cultural origins, improving emotional and social well-being. However, the Tausug language, the mother tongue of Tausug, encountered obstacles due to the increasing prominence of English as a widely utilized language. Therefore, exploring effective methods to encourage the preservation of Tausug mother tongue development and foster linguistic roots among Tausug children is essential. As such, this study investigated the effects and relationship between Bahasa Sug Mobile Learning Applications and traditional teaching methods in enhancing mother tongue development for Tausug toddlers.

2. Literature
2.1 Cultural Identity and Heritage
Language is essential to human culture and identity, allowing communication and expression. Preserving and nurturing a language is crucial for maintaining the identity and heritage of a person's culture. In the current era of globalization, many native languages are at risk of being forgotten due to assimilation into Western culture and language. However, language learning applications like Duolingo and Rosetta Stone offer a promising solution for promoting the advancement of mother tongue in early childhood education. This mobile app offers an excellent opportunity for children to enhance their proficiency in their native language in a fun and convenient way. The application enhances language proficiency, improving linguistic competence (Carreon et al., 2019). The dominance of English and other common languages has led to changes in language preferences and usage patterns, including within families. Unfortunately, this change presents challenges in developing and preserving mother tongues, such as Bahasa Sug, spoken by the Tausug community.

Preserving the mother tongue is crucial for maintaining linguistic and cultural diversity, as it helps individuals stay connected to their heritage, traditions, and values. García and Wei (2014) emphasize that maintaining one's native language is vital to passing cultural knowledge to future generations while Li (2018)

argues that advocating for one's native language positively affects self-identity, self-esteem, and community inclusion. It is essential to explore our cultural identity and heritage. Doing so allows us to acquire a deeper comprehension of our identity and our place in the world. Studying our heritage gives us a more extensive understanding and cultivates our overall knowledge.

2.2 Cognitive Approaches to Learning with Digital Materials

It is crucial to incorporate cognitive strategies to maximize the effectiveness and efficiency of digital learning materials. It is imperative to maintain the original meaning of the content and preserve all significant details. To achieve the best outcome, upholding the same professionalism and formality as the original text is crucial. These strategies will deliver the best outcomes in digital learning materials. Earlier studies have established that digital entertainment media contributes significantly to the cognitive growth of children during a crucial stage (Linuwih & Trihastutie, 2020). Children exposed to English-based digital media, including songs and nursery rhymes, enhance their grammar, vocabulary, and proficiency in English pronunciation (Alefeshat, 2019). In a study released by the Cognitive Impacts of Digital Media Workgroup, Anderson and Subrahmanyam (2017) found that there is a lack of evidence regarding the effects of digital screen device usage on young children in recent studies. Thus, the current research on digital technology usage and learning outcomes among children under five through screen interfaces requires revision. Hence, it is imperative to expand the existing knowledge base concerning the overall impact of digital technology and the specific impacts of using digital screens on children's development.

According to the cognitive load hypothesis, the working memory system processes information in digital learning material during the learning process and transfers it to long-term memory (Sweller et al., 2019). Learning changes the permanent memory system, which has a limitless capacity. Information processing influences learning by increasing cognitive burden. The number of elements acting simultaneously in working memory is called element interactivity. Learning domain-specific previous knowledge is the second factor and the third is the effort required to construct and automate new mental models. Schneider et al. (2022) suggest that intrinsic cognitive strain arises from high-element interactivity, lack of domain-specific prior knowledge, and the need to construct and automate new mental models. The ease or challenge of processing the information in digital learning materials affects the amount of "extraneous cognitive load," also known as "learning-irrelevant cognitive load." This is because the ease or difficulty of processing the information depends on how the learning material is presented or designed.

The concept of multimedia education (Mayer, 2014a) holds immense importance in digital media education, along with Cognitive Learning Theory (CLT). This theory presents a comprehensive model for the learning process, grounded in three fundamental assumptions. The theories proposed by Paivio (1986) and Baddeley (1992) serve as the foundation for the first proposition, which states that information processing happens through two distinct cognitive channels. Additionally, it acknowledges the constrained capabilities of the working

memory system, as posited by Baddeley's working memory model. Finally, it underscores the importance of learners engaging in active cognitive processes to create meaningful mental representations and models. The Cognitive Theory of Multimedia Learning (CTML) framework identifies and describes five distinct cognitive processes that engage learners during digital learning. These processes encompass the act of carefully choosing appropriate words and visuals, arranging them in a logical manner, and merging mental frameworks with previous knowledge in order to establish coherence. Mayer (2014a) observed the aforementioned cognitive processes in all sectors of multimedia communication.

2.3 Learning in the Digital Age

A study about the impact of gadget usage on cognitive development shows it is imperative to closely monitor the gadget facilities offered by parents for early childhood to mitigate any potential adverse effects that may impede children's cognitive development. According to Siregar et al. (2022), parents have the potential to utilize gadgets as engaging educational tools to enhance their children's cognitive abilities. Sowmya et al. (2019) examined the application of Chomsky's theory regarding the presence of a 'Language acquisition device' (LAD) in every child and experts believe that this device ingrains the fundamental principles and grammatical structures of a language into a child's brain. The study found that using gadgets has a beneficial effect on children's language development. Exposing children to various educational programs, videos, rhymes, and similar media sources can facilitate the acquisition of new vocabulary and enhance their language proficiency.

Sundqvist et al. (2021) conducted a study that established a correlation between some aspects of a 2-year-old's digital media environment and linguistic development. Increased exposure to T.V. content, whether on a large screen or tablet, is linked to negative impacts on language development. Similarly, the likelihood of parents incorporating digital media into everyday child routines shows a negative association with language development. However, positive parenting strategies, such as engaging in interactive conversations, joint media engagement (JME), and reading books, positively correlate with a child's language development.

2.4 Interactive and Engaging Learning Experience

Through today's integration of digital technologies into our everyday routines, toddlers are increasingly engaging in digital gaming activities, surpassing the levels observed in earlier generations. Consequently, the field of education is undergoing corresponding transformations. Digital game-based learning has shown remarkable growth during the past decade and, according to Greipl et al. (2020), there is a growing preference for a learning environment that is both interactive and visually engaging.

Integrating mobile learning apps into students' education can positively impact their learning habits and outcomes. Its potential to transform education is immense as it enhances student engagement and elevates language skills in language education. Research has demonstrated that incorporating technology into education not only enhances pupils' learning behaviors and results (Hwang & Tsai, 2011) but also holds the potential to revolutionize education by

captivating students' attention (Kukulska-Hulme & Traxler, 2013) and modern mobile language learning apps have the potential to dramatically revolutionize how people learn new languages (Heil et al., 2016).

According to numerous studies (Crompton & Burke, 2018), mobile learning (m-learning) substantially impacts the teaching and learning processes. The unique ability of m-learning to provide students with greater flexibility and access to innovative learning opportunities sets it apart from conventional learning methods. Mobile learning devices have gained popularity among students and educators due to their convenience and flexibility. As a result, there has been a rise in research and experimentation on educational mobile learning efficiency, as demonstrated in the work of Al-Shehri (2012). Mobile learning applications for mother tongue education have emerged as a promising approach to enhancing language learning experiences. These applications offer various interactive features and accessibility options that cater to the unique needs of learners. Research has highlighted the advantages of mobile educational apps in preserving and nurturing the mother tongue among diverse populations.

Mobile learning apps provide convenient and flexible access to language learning resources, breaking geographical barriers. Users can learn a language anytime and anywhere, fitting it into their busy schedules. The availability of offline capabilities ensures continued access to learning materials even in areas with limited internet connectivity. These applications offer various interactive language learning features, including gamification elements, quizzes, challenges, and multimedia content (Gikandi et al., 2011). Gamification elements motivate and engage learners, making language learning enjoyable and rewarding, while adaptive learning techniques personalize the learning experience, tailoring content and activities to individual learners' needs. It also promotes user-created content and community engagement, fostering collaboration among language learners (Godwin-Jones, 2019). Users can contribute their language resources, share cultural knowledge, and engage in peer-to-peer learning. This collaborative approach enhances language acquisition and creates a sense of ownership and community among learners.

Furthermore, mobile learning apps facilitate language proficiency assessment and tracking of learning outcomes (Kuimova et al., 2018). They provide opportunities for self-assessment, progress monitoring, and feedback, which promote learner motivation and goal setting. Additionally, some apps integrate certification options or badges to recognize and validate language proficiency.

2.5 Toddlers and Interactive Mobile Learning Apps

The influence of mobile educational applications on toddler development is how such apps can help promote cognitive, social, and emotional growth among young children. By engaging in interactive and educational content on their mobile devices, toddlers can enhance their language and communication skills, fine motor abilities, problem-solving abilities, and overall understanding of the world around them. Additionally, mobile apps can provide a safe and controlled environment for toddlers to explore new ideas, learn from mistakes, and build resilience, all while having fun and staying engaged. Ultimately, the effective

use of mobile learning apps can help parents and caregivers support the development and growth of a child in a meaningful and impactful way.

Mobile learning applications have shown the capacity to positively impact the advancement of toddlers by offering interactive and engaging educational experiences. These applications, specifically designed for young children, provide various benefits that support their cognitive, language, motor, and socio-emotional development. Featuring educational games, puzzles, and exercises that improve problem-solving, critical thinking, and memory, research has highlighted the positive impact of such mobile learning applications on toddlers' cognitive development. The main benefits are facilitating education, creating an interactive learning environment, and supporting children's learning and development. Mobile apps' interactive element enhances toddlers' curiosity and cognitive capacities (Nikolopoulou, 2021). Mobile learning applications improve children's cognitive development with age-appropriate information and exciting experiences.

The utilization of mobile media devices and apps by young children presents an opportunity to leverage the distinctive qualities of these devices in order to enhance their learning experiences and outcomes. While there are problems associated with utilizing mobile devices for educational purposes, the offer the potential benefits of aiding children in developing crucial abilities According to Judge et al. (2015), utilizing assistive technology and implementing best practices in Universal Design for Learning offers a feasible approach to customization and personalization for young children with disabilities to effectively utilize emerging and advanced technologies.

The field of child psychology recognizes the positive impact of mother tongue mobile learning applications on children's language development, cognitive skills, and socio-emotional well-being. These applications cater to children's specific developmental needs and provide a supportive learning environment that enhances their engagement and progress in language learning. According to a study conducted by Xie et al. (2020), engaging in certain activities can positively impact the development of preschoolers. Studies have also shown that engaging in these activities can improve attention, memory, imagination, and proficiency while promoting discipline.

Mother tongue mobile learning applications contribute significantly to children's language development. Research shows that exposing children to educational content in their mother tongue promotes vocabulary acquisition, comprehension, and fluency (Kukulska-Hulme et al., 2018). By engaging children in interactive language activities, such as word games, storytelling, and pronunciation exercises, these applications facilitate the development of linguistic skills specific to their mother tongue. This targeted language learning experience helps children build a strong foundation in their mother tongue, leading to improved language abilities and self-confidence.

Mother tongue mobile learning applications also have a good effect on cognitive skills. These apps often incorporate educational games and problem-solving activities that stimulate critical thinking, memory, and cognitive flexibility.

Mobile learning apps enhance children's executive functions, attention span, and logical reasoning abilities by engaging them in these cognitive challenges. Furthermore, these interactive and engaging applications facilitate active engagement and deepen children's cognitive processing during learning (Wu et al., 2012).

Regarding socio-emotional well-being, mother tongue mobile learning applications can positively impact children's self-esteem, cultural identity, and feelings of belonging. Children using mobile apps designed specifically for their mother tongue reinforces their cultural heritage and fosters a positive attitude toward their language and culture. This recognition and affirmation of their mother tongue contributes to a robust feeling of identity, pride, and cultural continuity.

3. Methodology
3.1 Research Design
This study utilized an experimental design with a mixed-methods strategy that incorporates both quantitative and qualitative methodologies. In the quantitative approach, data were gathered through the identification in both the pre-test and post-test phases from a sample of toddlers. The question about how the apps help the language development of toddlers was qualitative. The quantitative aspect was the questions regarding the perception of parents on the Bahas Sug Mobile Apps. The sample was selected via purposive sampling, drawing from eight barangays within the Jolo Municipality. The participants were asked to identify a number (umbul) from 1 (isa), 2 (duwa), 3 (tu), 4 (upat), 5 (lima), 6 (unum), 7 (pitu), 8 (walu) 9 (siyam) and 10 (hangpu'); 8 shapes (hantang) such as circle (lingkung), square (Pasagi'), rectangle (mustatil), oblong (pahaba), star (bituunun), heart (jantung), diamond (lumaduun) and triangle (lungigi') and ten colors, such as red (pula), blue (bilu), yellow (biyaning), violet (taluk), orange (kulit), green (gaddung), brown (kawsun), black (itum), pink (kalas), white (puti') in Bahasa Sug for pre-test using the flashcards. The Bahasa Sug Mobile Learning app was installed in their parents' cellphones. The following week's post-test was conducted to ask to identify a number from 1-10, eight shapes, and 10 colors with the application of mobile apps. Flashcards were still used to identify the items of their answers and were recorded immediately. Then, the number of correct answers on the pre-test were compared to the number of correct answers on the post-test.

3.2. Participants and Locale of the Study
The study selected participants through purposive sampling and obtained data from eight barangays within the Jolo Municipality. In each barangay, 20 toddlers with their respective parents/guardians were randomly selected. A total of 160 participants were among the toddlers and 160 parents. The toddlers' age ranged from 2 to 5 years old, 2-3 years, 40 %, and 4-5 years, 60% of 160, respectively. The toddlers' gender distribution was equal, with 50% females and 50% males out of 160. The respective parents of the toddlers had an educational background of college level, 27%, 58% were college graduates, 12% had a master's degree, and 3% had a doctorate. The preferred communication language of toddlers and

parents was a combination of mother tongue and English. The frequency of exposure to the Bahasa Sug language outside the application was less frequent.

3.3. Research Instruments

The research instrument used flashcards on toddlers to assess their level of learning in terms of shapes, numbers, and colors. In addition to flashcards, questionnaires were utilized to assess the efficiency of the Bahasa Sug Mobile learning application from the parents' perspective. The questionnaire consisted of two parts. Part I gathered the demographic information about the toddlers and their parents' educational background and the language often used in communication with toddlers. Part II was used to gather language proficiency, cultural connection/implication, engagement and participation, and parent perceptions. The researchers designed the instruments, and four peers were asked to validate them. The questionnaires were utilized to measure the perception of parents related to learning.

3.4. Data Collection Procedures.

The researchers asked for permission from the Barangay Captain to conduct the study. Once the permission was granted, the researchers selected the houses with an interval of five. Every count of five would be selected as respondents. If there were no available toddlers, the next house would be selected. Then, it returned to count from one to five until the required number of respondents was completed.

3.5. Data Analysis.

The statistical tool used to analyze data was the t-test, which was used to compare the traditional teaching method (control groups) and the Bahasa Sug Mobile Learning apps (experimental groups) based on how well the toddlers did on the pre-test and post-test.

4. Results and Discussions

4.1. Effects of Bahasa Sug Mobile Learning Applications.

The effects of the Bahasa Sug Mobile Learning Applications were measured according to language proficiency outcome, cultural connection outcome, engagement and participation, parent perception of the Bahasa Sug mobile learning application, and the pre and post-test performance of the toddlers, as shown in Figure 1.
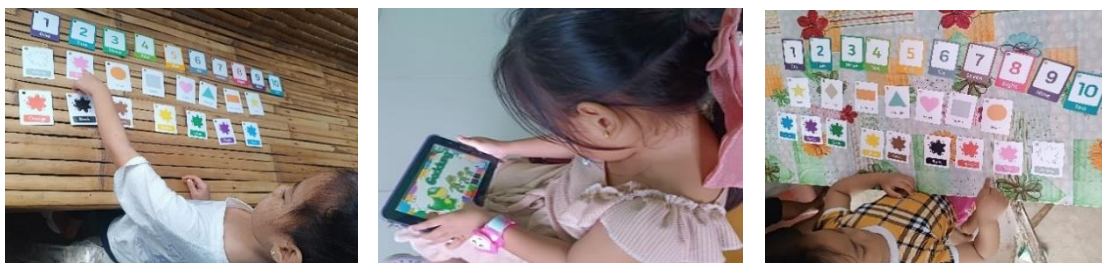

Figure 1. Pre-test Evaluation, During the Learning Process, and Post-test Evaluation

Table 1. Language Proficiency Outcome

Language Proficiency	Strongly Agree (5)	Agree (4)	Neutral (3)	Disagree (2)	Strongly Disagree (1)
1. The Bahasa Sug Mobile Learning Application helped my child recognize and name shapes accurately in Bahasa Sug.	45%	22%	11%	15%	7%
2. The Bahasa Sug Mobile Learning Application helped my child understand and use numbers in Bahasa Sug.	32%	40%	10%	11%	8%
3. The Bahasa Sug Mobile Learning Application helped my child identify and name colors correctly in Bahasa Sug.	54.4%	26.1%	10%	6.2%	3.3%
4. My child's overall language proficiency in the Tausug language has improved after using the application.	41.3%	28.0%	18.7%	10.0%	2.0%
5. Application provided appropriate and effective language learning activities for my child.	38.0%	33.2%	18.5%	7.6%	2.7%

Table 1 shows how the respondents thought their children did in terms of language skills: For 'The Bahasa Sug Mobile Learning Application helped my child recognize and name shapes accurately in Bahasa Sug', 45% highly agree and 22% agree. For 'The Bahasa Sug Mobile Learning Application helped my child understand and use numbers in Bahasa Sug32% strongly agreed and 40% agree. For 'The Bahasa Sug Mobile Learning Application helped my child identify and name colors correctly in Bahasa Sug', 54% highly agreed and 26% agreed. For the statement 'My child's overall language proficiency in the Tausug language has improved after using the application', 41.3% of people strongly agreed and 28% agreed. Also, 38% of people strongly agreed and 33.2% agreed that the application 'provided appropriate and effective language learning activities for my child'. In relation to Piaget (1971), children exhibit heightened curiosity that provides a strong desire to explore their environment. This theory significantly emphasizes providing toddlers with a supportive and intellectually stimulating learning environment, enabling them to engage in language acquisition actively. The utilization of mobile learning applications offers children the chance to harness their inherent capabilities, fostering cognitive advancement and the growth of their language skills. Before entering preschool, children begin to improve their language and reading skills.

The study conducted by Sowmya et al. (2019) examined the application of Chomsky's theory regarding the presence of a 'Language acquisition device' (LAD) in every child. This device is believed to encode a language's fundamental principles and grammatical structures into the child's brain. The study's findings indicate that the utilization of gadgets has a positive impact on the language development of children. Exposing children to various educational programs, videos, rhymes, and similar media sources can facilitate the acquisition of new vocabulary and enhance their language proficiency.

Furthermore, mobile learning apps facilitate language proficiency assessment and tracking of learning outcomes (Kuimova et al., 2018). Embracing this mobile learning application can ensure the continuity and vitality of native languages, allowing children to maintain a strong connection with their cultural heritage and linguistic identity.

Using language learning applications for mother tongue development is now proven advantageous. Firstly, these apps offer a personalized and engaging learning experience tailored to toddlers' needs and preferences. The interactive features, visual aids, and gamification elements keep children motivated and enthusiastic about learning their mother tongue. Secondly, language learning apps provide a convenient and accessible platform, allowing toddlers to learn at their own pace, whenever and whenever they like. This flexibility enables consistent exposure to the mother tongue, facilitating a deep and lasting connection to their cultural heritage. Finally, language learning apps foster a positive and nurturing environment, promoting self-confidence and pride in one's cultural identity. By preserving and nurturing the mother tongue, these apps empower toddlers to embrace their linguistic heritage and actively contribute to preserving their cultural diversity (Konstantakis et al., 2022).

Furthermore, preserving a child's native language can help build a positive self-image, boost confidence, and encourage cultural appreciation among young children. Retaining their linguistic heritage helps children feel more connected to their cultural origins, leading to improved emotional and social well-being. The mother tongue provides a deep and lasting connection to cultural heritage. Table 2 shows how the parents of toddlers perceived the interrelationship between mother tongue and culture.

Table 2. Cultural Connection Outcome

Cultural Connection	Strongly Agree (5)	Agree (4)	Neutral (3)	Disagree (2)	Strongly Disagree (1)
1. The Bahasa Sug Mobile Learning Application helped my child understand the cultural significance of shapes, numbers, and colors in the Tausug culture more than the traditional teaching methods.	54.0%	32.0%	11.0%	2.0%	1.0%
2. My child demonstrates a stronger connection to the Tausug cultural heritage after using the application.	50.0%	36.2%	11.0%	1.9%	1.0%
3. The application effectively incorporated Tausug cultural elements related to shapes, numbers, and colors.	51.7%	34.4%	11.4%	1.9%	0.6%
4. The application fostered a sense of pride and appreciation for the Tausug cultural identity in my child.	46.0%	22.0%	11.0%	14.0%	7.0%
5. My child actively engaged with the application's cultural content and activities related to shapes, numbers, and colors.	40.0%	39.0%	7.0%	7.0%	7.0%

On the basis of the author's interpretation of the above statements, all are found to be positive, where all strongly agree and agree statements together total more than 51%. According to Konstantakis et al. (2022), using language learning applications for mother tongue development is advantageous. Firstly, these apps offer a personalized and engaging learning experience tailored to toddlers' needs and preferences. The interactive features, visual aids, and gamification elements keep children motivated and enthusiastic about learning their mother tongue. Secondly, language learning apps provide a convenient and accessible platform, allowing toddlers to learn at their own pace, anytime, whenever they like. This flexibility enables consistent exposure to the mother tongue, facilitating a deep and lasting connection to their cultural heritage. Finally, language learning apps foster a positive and nurturing environment, promoting self-confidence and pride in one's cultural identity. By preserving and nurturing the mother tongue, these apps empower toddlers to embrace their linguistic heritage and actively contribute to preserving their cultural diversity.

The collaboration between parents and educators creates a supportive enrichment of an environment that enhances preschoolers' overall educational learning experiences in relation to mobile learning applications, which could have socio-emotional benefits for toddlers (Kucirkova, 2021). The engagement and participation statements are described in Table 3, which they considered as valuable.

Table 3. Engagement and Participation

Engagement and Participation	Strongly Agree (5)	Agree (4)	Neutral (3)	Disagree (2)	Strongly Disagree (1)
1. My child showed interest and enthusiasm while using the Bahasa Sug Mobile Learning Application.	42.0%	23.5%	17.5%	10.%	7.0%
2. My child actively participated in the language learning activities related to shapes, numbers, and colors provided by the application.	52.5%	25.0%	7.5%	9.3%	6.7%
3. The application captured my child's attention and maintained engagement.	42.3%	18.2%	9.2%	28.2%	2.1%
4. My child voluntarily used the application and showed eagerness to learn Tausug language concepts related to shapes, numbers, and colors.	52.1%	28.2%	6.5%	9.2%	4.0%
5. The application motivated my child to spend more time learning and practicing the Tausug language.	65.%	23.5%	2.0%	9.0%	0.5%

Table 3 reveals that the sum of responses to the above statements that agree and strongly agree is more than 51%, which is considered the positive value of engagement and participation. Kuimova et al. (2018) emphasized that they provide opportunities for self-assessment, progress monitoring, and feedback, which promote learner motivation and goal setting. Additionally, some apps

integrate certification options or badges to recognize and validate language proficiency.

Table 4. Parent Perceptions on Bahasa Sug Mobile Learning Application

Parent perception	Strongly Agree (5)	Agree (4)	Neutral (3)	Disagree (2)	Strongly Disagree (1)
1. I believe the Bahasa Sug Mobile Learning Application has positively influenced my child's language development in the areas of shapes, numbers, and colors.	50.56%	40%	7.22%	1.66%	0.56%
2. The application has increased my child's interest in learning the Tausug language related to shapes, numbers, and colors.	49.45%	41.11%	6.11%	2.22&	1.11%
3. I have observed an improvement in my child's understanding and usage of Tausug language concepts related to shapes, numbers, and colors after using the application.	51.11%	39.44%	8.33%	0.56%	0.56%
4. The application has enhanced my child's understanding and appreciation of our Tausug cultural heritage, particularly in relation to shapes, numbers, and colors.	50%	40.56%	5%	3.33%	1.11%
5. I would recommend the Bahasa Sug Mobile Learning Application to other parents for language development in the areas of shapes, numbers, and colors in the Tausug language.	48.88%	41.67%	7.78%	1.11%	0.56%

Table 4 displays the five items or statements pertaining to the perceptions of toddler's parents that received favorable responses or answers—where agree and strongly agree sum more than 51%—and which toddler parents perceived as valuable. The perception of parents has a relationship with a study conducted by UNESCO in 2016 that teaching children in their native language as their first language can help them understand ideas and make it easier for them to learn another language later. The cognitive development theory (Piaget, 1971) emphasizes the value of providing a supportive and stimulating educational setting for toddlers to explore and engage in language learning, and using mobile applications provides opportunities for children to tap into their innate abilities, stimulate cognitive growth, and facilitate their language development. This is in relation to parents' perception of the cognitive learning of their children.

The Comparative Analysis of Achievement Test Results between Bahasa Sug Mobile Learning Applications and Traditional Teaching Methods. A sample of 160 toddlers was selected for the pre-test and post-test assessments. The t-values for eight barangays in the Municipality of Jolo, used a significance threshold of 0.05 probability and a degree of freedom of 19.

Table 5. The Mean Score of the Pre-test and Post-test of the Traditional Teaching Method (Control Groups) and Bahasa Sug Mobile Learning apps (Experimental Groups) Using the T-test

Barangay	Pre-test Mean	Post-test Mean	t-test	p-value (α=0.05)	Remarks
Bus – Bus	8.95	26.40	78.142	0.0006	High Significance
Walled City	8.65	27.00	78.696	0.0908	Insignificant
Chinese Pier	8.55	27.05	78.696	0.0474	Significant
Asturias	8.90	27.20	64.882	0.4157	Insignificant
Takut – Takut	9.55	26.70	92.755	0.0169	High Significance
Tulay	9.90	27.10	92.755	0.0418	Significance
Alat	9.00	27.15	68.187	0.0036	High Significance
San Raymundo	9.35	27.10	68.187	0.0078	High Significance

The results of the majority in the table showed high significance in the t-test. The data indicated on the achievement t-test that the Bahasa Sug Mobile learning app was better than the traditional teaching methods.

5. Conclusions

The researchers conclude that the Bahasa Sug mobile learning application induced learning among toddlers better than traditional teaching methods, as shown in the t-values for eight barangays in the Municipality of Jolo which have a high significance threshold of 0.05 probability and a degree of freedom of 19. In the final analysis, parents value the cultural connection outcome of the data which reveals that using mobile learning apps increased knowledge of the Tausug language. The Bahasa Sug apps empower toddlers to embrace their linguistic heritage and actively contribute to preserving their cultural diversity, as it helps individuals stay connected to their heritage, traditions, and values. They signify that the mother tongue provides a deep and lasting connection to cultural heritage, especially in preserving and nurturing the Tausug language, which promotes self-confidence and pride in one's cultural identity.

Bahasa Sug Mobile Learning applications help them understand the cultural significance of shapes, numbers, and colors in the Tausug culture more than the traditional teaching methods. The application effectively incorporates Tausug cultural elements related to shapes, numbers, and colors and fosters interest in language learning apps for preserving the mother tongue as linguistic and cultural diversity.

Engagement and participation in using the Bahasa Sug Mobile Learning Application increased the interest and enthusiasm of the toddlers to participate in the language learning activities related to shapes, numbers, and colors. The application captures the child's attention and maintains their engagement and eagerness to learn Tausug language concepts related to shapes, numbers, and colors. The application motivates the child to spend more time learning and practicing the Tausug language.

The data indicate on the achievement t-test that the Bahasa Sug Mobile learning app is better than the traditional teaching methods. Thus, the Bahasa Sug Mobile

Learning Application tool enhances the preservation and nurturing of the toddlers' mother tongue.

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