

# Implementation of the Singing Method to Improve the Numeracy Skills of Grade 1 Immigrant Children in Malaysia

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**ABSTRACT:** This study aims to examine the singing method as a learning strategy to improve the numeracy skills of grade 1 students at SB AMI Penang, Malaysia. This research uses a qualitative method with a case study approach whose data is collected through observation, in-depth interviews, and documentation. This study involved 11 participants, consisting of 8 students in class 1A and 3 students in class 1B conducted at the Sanggar Bimbingan AMI in Penang, Malaysia, a non-formal educational institution that provides learning services for primary school children. The results of the study show that the singing method is able to create a pleasant learning atmosphere, increase student activity, and help students remember the sequence of numbers and understand simple summation through lyrics, rhythm, and hand movements. The singing method is more optimal if there is help from other learning media. The contribution of this research focuses on the development of innovative learning methods in a non-formal educational environment, especially in improving basic mathematics skills. The findings show that this method is effective as an alternative to numeracy learning in non-formal education with limited resources.

**Keywords:** Singing Method, Numeracy, Immigrant Children, Non-formal Education

## INTRODUCTION

Mathematics is a compulsory subject as stated in Law Number 20 of 2003 concerning the National Education System and is supported by Government Regulation Number 4 of 2022 concerning National Education Standards [1, 2]. At the elementary school level, numeracy is a basic skill in mathematics learning. Numeracy skills are very important for humans, therefore they must be taught from an early age using the right media and methods so as not to have a negative impact on children's development [3]. Primary school students aged 7 to 12 years are at the concrete operational stage, where learning is strongly influenced by hands-on experience and engaging teaching methods [4]. During this time, children experience rapid cognitive and social growth, so many find it difficult to stay focused on learning, especially in math lessons. One factor that affects this is the use of unattractive teaching methods [5].

This condition becomes even more appropriate when it is associated with the children of Indonesian Migrant Workers in Malaysia. Many Indonesian children of migrant workers in Malaysia are unable to obtain formal education due to a lack of legal documents. Malaysian education regulations do not allow foreign nationals to attend school [6]. According to BP2MI, around 4.5 million Indonesian Migrant Workers are working abroad without official procedures, and Malaysia has the highest number, with around 1,318,748 people, according to BP2MI mapping in destination countries [7].

This situation encourages various educational program initiatives to support migrant workers in obtaining their educational rights. Sanggar Bimbingan is a non-formal education center supported by the Education and Culture Attaché (Atdikbud) of the Indonesian Embassy. This Sanggar Bimbingan (SB) provides another opportunity for children to continue learning in accordance with the Indonesian curriculum when they cannot attend a regular school in Malaysia due to a lack of the necessary official documents [8]. The teaching and learning process at SB has been running properly. However,



the results of observations show that the learning process at SB still faces obstacles, especially for grade 1 students who are not fluent in arithmetic. This is influenced by the use of less engaging learning methods, limited educators, and a lack of learning facilities, which contribute to students' academic lag, especially in core subjects such as Mathematics, Indonesian Language, and Natural Sciences [9].

Therefore, the choice of learning method is very influential in creating a pleasant learning atmosphere, especially in mathematics learning in the lower grades. Early childhood students tend to like learning that is not monotonous and involves elements of fun, such as songs that create a comfortable, conducive learning atmosphere [10]. The singing method was chosen because it is very close to the students. The 1st-grade children are very excited when they are invited to sing and play. Fun learning can increase motivation, make the material more meaningful, and encourage active student involvement [11]. Songs can help students learn to control themselves and feel more confident. This is why music, art, and creative activities play a huge role in early childhood education, as they provide an enjoyable learning experience [12].

In this study the singing method was applied as a mathematics learning approach to increase students' concentration and enthusiasm. In general, previous studies have shown that singing techniques are beneficial in teaching arithmetic, although there are differences in focus and approach. Novitasarsi [13] emphasized that the combination of singing methods with jarimatic techniques that unite auditory and kinesthetic elements to deepen the understanding of number symbols (cognitive aspects). On the other hand, Dyah Aryani [14] prioritizes the contribution of the singing method in creating a pleasant learning environment, which has a positive effect on learning outcomes. Meanwhile, Riskania [15] highlighted affective factors, such as increased enthusiasm, confidence, and student involvement during the learning process. The three studies show that research on singing methods is still fragmented, with more emphasis on one side (cognitive or affective) and conducted in a formal education setting. Thus, there is a gap in research to explore the method of singing in a more comprehensive way. This research emerged with an innovation by combining analysis from the cognitive (numeracy skills) and affective (participation in learning) sides simultaneously in the context of non-formal education.

However, this research is different from previous research. The difference between this study and the previous research is that this study focuses on the context of migrant children who are unable to pursue formal education as they should. The main focus of this research is on how the singing method can increase enthusiasm for learning and strengthen numeracy skills among immigrant children through fun methods. The background of this research stems from the problem of students' low interest and numeracy skills, due to less engaging learning methods that tend to be monotonous. Low-grade students at the concrete operational stage need a fun, concrete, and easy-to-understand learning experience. The singing method was chosen because it created an active, enthusiastic learning atmosphere while making it easier for students to remember basic calculation concepts through lyrics, rhythm, and repetition [16].

This research is expected to contribute to the understanding of innovative and fun learning methods in the realm of non-formal education, especially for immigrant children. Using the singing method in the basic mathematics learning process is believed to support the cognitive development of low-grade students and strengthen learning theories based on multisensory methods (auditory, kinesthetic, and visual). This research is also expected to serve as a reference for creating engaging and fun learning methods tailored to the characteristics of low-grade children, especially in a learning environment with limited resources.

## RESEARCH METHODS

The approach used in this study is qualitative, a research approach that describes events happening now, with the researcher taking events as the focus of his attention to then describe them as they are [17]. The research method used is a case study, as it allows the researcher to analyze a phenomenon in depth and detail. That is, how the singing method improves numeracy skills in low-grade children [18].

The research was conducted at the Sanggar Bimbingan (SB) AMI Penang located in Bukit Mertajam, Penang Island, Malaysia. During the study, the researcher was directly involved in the observation and in-depth interviews with the speakers and studio managers to understand their experiences and perspectives on learning to count through the singing method. This research focuses only on the concept of numbers under 20, with sums below 10. There are 2 data sources for this research: primary and secondary data. The primary data in this study are grade 1 students of the SB, 2 speakers, and the manager of SB AMI Penang Malaysia. This study involved 11 first-grade immigrant students, with details of 8 students from class 1A and 3 from class 1B. The informants

have characteristics as students who are still in the early stages of basic education, with various abilities in arithmetic, ranging from recognizing numbers to being able to sequence simple numbers. In addition, there is variation in terms of their activeness and readiness to learn during the learning process.

In the selection of informants for this study, purposive sampling techniques are used, namely the selection of informants that are carried out deliberately and based on criteria that are in accordance with the purpose of the study. The criteria used include grade 1 students who have difficulty in basic numeracy skills and who are directly involved in the application of singing methods during learning activities. Secondary data in this study were obtained from various written sources, including scientific journal articles, official reports from related institutions, and supporting documents relevant to the research focus.

In this study, data was collected through observation, interviews, and documentation. Data was obtained through direct observation of students' activities and numeracy skills during the learning process. Researchers made observations by being directly involved in the learning process at the SB AMI (Anak Malaysia Indonesia) in Penang. Interviews were conducted with two main groups of informants, the first with International Partnership KKN (KKN-KI) students who acted as presenters, interviews were also conducted with the Manager of SB AMI Penang, who understood the social and educational context of migrant children at large, as well as documentation carried out by collecting data in visual form related to the implementation of singing methods in learning at SB AMI Penang.

The data analysis technique of this study was derived from the results of data collection, using the interactive analysis model by Miles, Huberman, and Saldana [19] which is the first stage of data collection through observation, interviews, and documentation. After data collection, the researcher selects and simplifies the data to focus on relevant information. The third stage is to present the data in a systematic, easy-to-understand manner. Data can be presented in the form of descriptive narratives, tables, graphs, or charts of relationships between variables. The final stage is to draw conclusions from the data patterns, then verify their correctness through triangulation (comparing the results of observations, interviews, and documentation). This process is carried out continuously during and after data collection.

## RESULT AND DISCUSSION

Grade 1 students are divided into 2 groups, namely class 1A with 8 students and class 1B with 3 students. Grade 1 is grouped based on the basic math skills that students have, to tailor the teacher's instructional methods to the needs of the students. Class 1A consists of students who are still learning basic arithmetic and require repetition of material such as counting numbers and sorting numbers. Students who are already able to calculate fluently and understand the material so that they can continue it are grouped in class 1B. At the time of the study, classes 1A and 1B were combined into 1 study group and participated in joint learning. The merging of these classes was carried out by considering the learning conditions at the research site, including the number of students and the effectiveness of teaching and learning activities.

Students of class 1A who still struggle with arithmetic receive gradual repetition of the material and assistance. In contrast, students of grade 1B who are fluent in arithmetic are directed to strengthen and deepen their understanding of the material. This is in line with the theory of Zone of Proximal Development (ZPD) put forward by Lev Vygotsky [20]. This theory states that learning experiences will be more successful when students receive support from individuals who are more experienced or have more expertise. The combination of students from classes 1A and 1B creates a social learning atmosphere, where students from class 1B function as More Knowledgeable Others (MKO) for their peers in class 1A. The gradual process of providing assistance mentioned in the study is a manifestation of scaffolding strategies, in which educators provide measurable instructional support to bridge the gap between students' actual abilities and their developmental potential.

### Application of Singing Methods in Learning

The singing method is a learning method that uses singing activities to convey material, making the learning process more engaging, fun, and easier for students to understand. Singing is not only entertainment but also a way to improve memory through the repetition of lyrics with rhythm. This method is considered effective, especially for low-grade students, as it aligns with their nature, making it easier for them to respond to concrete, interactive, and passionate learning [21]. The steps to implement the singing method at SB AMI Penang, Malaysia, are as follows.

#### a. Make a lesson plan (Learning Implementation Plan)

Before learning, educators must first create a learning plan. Planning is very important before starting learning, because well-planned learning will go well and you can achieve the desired learning goals [22]. In the learning plan, the presenter arranges learning activities and prepares

songs whose lyrics are align with the learning material to be covered. The song used in this lesson is "1 plus 1 equals 2 and the lyrics are changed to match the number the students want to answer. The use of songs is also followed by hand movements according to the numbers mentioned in the song.

#### b. Learning Implementation

Before the singing method is applied, students are first explained the counting material. This initial explanation aims to introduce students to the basic concept of addition, including recognizing numbers, understanding the meaning of addition, and connecting number symbols to the number of objects, as outlined in the lesson plan prepared by the presenter. The material is delivered in stages so that it can be understood by all students, especially in class 1A, which still has students who have difficulty with arithmetic. The elaboration of this material is carried out as a form of strengthening mathematical concepts. Through this explanation, students are directed to understand the process of logical addition, so that they not only memorize the lyrics of the song but also understand the meanings of the symbols used in the counting operations. The presenter also gave examples of simple summation questions that involved students directly through oral questions and answers.

After students understand the basic calculation material, the singing method is applied as a learning-strengthening activity. Starting with introducing the notes and lyrics to the students, the teacher sang the song several times and invited the students to follow along so they could quickly memorize it. When students begin memorizing the song's notes and lyrics, the teacher teaches hand movements corresponding to the so-called numbers, which the students repeat. This method involves combining songs and hand movements that are adjusted to the numbers in the song lyrics. Each time the summation lyrics are sung, students are asked to indicate the number of numbers using finger or hand movements. This movement aims to be a concrete picture of the numbers being studied, so that students can relate number symbols, song lyrics, and numbers directly. Based on Figure 1, during the teaching-learning process, students look very excited, which can be seen from their active participation in various activities carried out.



FIGURE 1. Learning Documentation

The use of music and movement in learning can make the experience more enjoyable and less stressful, helping children learn while playing and trying new things in a fun, relaxed way [12]. The integration between song lyrics and hand movements as a symbol of numbers is a manifestation of the enactive representation in the theory of instructional development proposed by Jerome Bruner [23]. In this phase, children understand their environment through physical activity, therefore finger movements while singing help students transform abstract mathematical symbols into real motor experiences. Combining singing methods with motor activities helps students understand the concept of numeracy more concretely [13]. Combining movement art and song also plays a very important role in increasing children's involvement and their ability to follow movements in a coordinated manner, thereby making the learning process more meaningful [24].

#### c. Learning Reflection and Evaluation

After the lesson, the speaker assesses students' understanding by asking several questions. This evaluation can be conducted through a written or an oral test. Learning evaluation is a very important part of the teaching and learning process because it can show the extent to which the methods used are successful and to what extent students understand the material being taught.

By evaluating appropriately, educators can find out the advantages and disadvantages in the teaching and learning process, so that they can plan improvements and innovations to improve the quality of education. Evaluation is not only used to find out the extent to which students have achieved their competence, but also helps teachers to reflect and devise better ways of teaching. Therefore, various types of assessments, both periodic and final, can be used according to the learning objectives to be achieved [25]. At the end of the learning, the presenter reflects and evaluates the learning by giving oral questions to the students. The presenter gave a summation question and if the student knew the answer, they could immediately raise their hand and answer the question.

**Results of the Implementation of the Singing Method in Learning**

This research focuses on class 1A because, based on initial observations made before the singing method was applied, most students in class 1A are still lacking in basic arithmetic. It can be seen in the ability to recognize numbers and to list them in order. The data shows that out of 8 students in class 1A, only 1 student (12.5%) is able to pronounce the sequence of numbers 1-10 independently, while the other 7 students (87.5%) still need the help of a teacher. On the other hand, all students of grade 1B have shown better numeracy skills independently, this condition shows that there is a significant difference in early numeracy skills.

As seen in Table 1, after the singing method was carried out, students of class 1A experienced development, where they began to be able to pronounce the numbers 1 to 10 more fluently and perform simple summation using the help of song lyrics and hand movements. This change shows that the singing method makes a good contribution to improving the understanding of number concepts in students.

**TABLE 1.** Class 1A Ability Development (Descriptive)

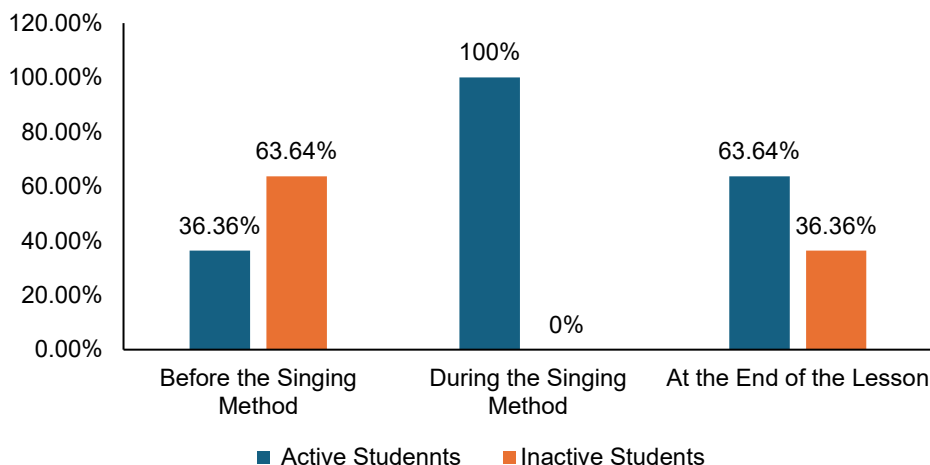
| Aspect             | Before the Method                   | After the Singing Method           |
|--------------------|-------------------------------------|------------------------------------|
| Number Recognition | Most students were not yet fluent   | Started to improv                  |
| Number Sequence    | The majority had difficulties       | Fluent from 1-10                   |
| Simple Addition    | Not yet able to perform independent | Able with songs and hand movements |

Singing activities that combine rhythm, lyrics, and repetitive passages help students remember number concepts more easily and naturally. These findings are strengthened by the theory of cognitive development by Piaget [26] who explains that learning that is concrete and involves direct activities has been proven to be effective in helping students' understanding. A more fun and interesting learning atmosphere makes students more interested and enthusiastic in participating in learning activities. Active student engagement through singing and movement helps strengthen understanding of the concept of numbers, as students not only hear, but also participate and experience hands-on learning.

The results of this study are in accordance with previous research by Rahayu [10] which showed that singing can help improve children's thinking skills, especially in understanding numbers. Singing can strengthen children's memory skills because through the repetition of song words and rhythms, information is more easily recorded in children's memory in a long-lasting way. Another research conducted by Ningsi [27] also showed that singing can help children better understand number concepts because learning is carried out in a fun atmosphere, making it easier for children to accept and understand the material taught.

The application of the singing method showed a positive impact on students' activeness and numeracy comprehension. Class 1A, which previously had difficulties in focusing on learning and basic arithmetic, showed an increase in learning activities after the singing method was applied. Data can be seen in figure 2, before learning using the singing method, only 4 out of 11 students in grades 1A and 1B, or 36.4% of the class, engaged in active learning. This shows that before the application of this method, most students were still passive and had not been fully engaged in learning. During the implementation of learning, the students' activeness increased significantly to 100%, all students actively participated in singing activities with hand movements and answering the questions given. This active involvement shows that students have a passion for learning and are comfortable with the methods used.

The research results show that the singing method has increased student activity and participation in learning. After using the singing method, some less enthusiastic students showed better focus and followed learning instructions more closely. Students appear more excited and enthusiastic during the learning process, especially when they sing and follow the movements.



**FIGURE 2.** Results of Increasing Student Activity

The children are in a stage of development that includes the physical, cognitive, social, and emotional aspects described in the theory of Cognitive Development by Piaget [26]. That's why every learning strategy should be designed with the needs of those developments in mind. An interactive learning approach that allows for exploration and feels fun is essential for building a child's curiosity and creativity [28]. It is supported by Lestari's [29] research, which shows that singing strategies positively impact the learning process by increasing students' enthusiasm, active engagement, and motivation. The songs in the learning session can really grab the children's attention, helping them focus on what the teacher is saying and doing. When the child's attention is focused on the teacher, it will be easier for the teacher to explain the lesson [12].

However, there was a change in activeness after the singing method was applied, the number of active students at the end of the lesson dropped to 7, or 63.6%. This decrease does not mean that the methods used are less effective, but because of a shift in activity. Students who previously moved physically began to face a more abstract stage of understanding, so adjustments needed to remain focused on learning. The success of this approach in encouraging overall student engagement confirms the importance of the enactive stage according to Bruner [23] in which children learn optimally through hands-on activities and real experiences. However, changes in activity levels at the end of the session suggest that the switch from physical activity to symbolic understanding does not occur suddenly. The decrease in concentration shows that students still need physical stimulation and need stronger support (scaffolding) in order to maintain a focus on learning in line with Lev Vygotsky's [20] theory which emphasizes the importance of providing assistance to students during the gradual teaching and learning process.

These findings suggest that students' reactions to singing methods vary, these differences are closely related to each student's personality and their individual learning readiness. This statement is in line with the findings of previous research conducted by Aini [30] which showed that not all students experience noticeable changes after implementing certain learning strategies. Therefore, a teacher must always try to improve his professional skills, especially in developing new and interesting ways of teaching that make learning more interesting. These efforts should be supported by the ability to change teaching methods based on the needs of each student, so that the learning experience becomes more relevant and better overall. Because each student learns in a different way, the way teachers teach must be appropriate for the child's development as they age. This is something that teachers need to think carefully about when choosing and using the best ways to teach [31].

To address students' diverse responses to singing methods, especially when enthusiasm wanes after the singing activity ends, stronger additional support is needed to optimize these methods in learning. Learning media provides additional knowledge and understanding to students, so that they can more easily understand the material being taught. To increase students' enthusiasm for learning, teachers can utilize various types of learning media that are interesting and suitable for the material being taught. Using tools or materials as a means of learning can make students more interested and make the learning process more interesting and fun [32]. Game Based Learning can also keep students engaged not only in the emotional aspect but also in the cognitive and behavioral aspects. Sinaga et al. emphasized that games in mathematics learning can create a fun learning experience

while increasing motivation, active participation, and understanding of elementary school students' concepts [33].

### **Obstacles and Challenges Implementation of the Singing Method**

Although the singing method can create a fun learning environment and increase student engagement, its implementation in practice faces many challenges. Limited classrooms are the main obstacle in the implementation of learning. Because in 1 room is occupied by 2-3 different classes, this causes students to lack concentration and focus is easily distracted to other things. Another challenge in implementing the singing method is that students still do not fully understand the lyrics of the songs used. Based on observations, some students can only follow the movements without properly memorizing or understanding the lyrics, even after the activity is repeated several times. This situation shows that each student has a different learning style and level of understanding.

Students have different personalities, thinking abilities, and attention spans; the same teaching methods do not always have the same effect on all students. In accordance with previous research, which states that learning that attends to the diversity of learning styles through process differentiation can help meet students' individual learning needs [34]. Therefore, teachers need to adjust their teaching methods to students' individual characteristics to achieve learning goals as effectively as possible.

### **CONCLUSION**

Based on research and discussion, it can be concluded that the application of the singing method in numeracy learning at SB AMI Penang Malaysia has a positive impact on the activities and level of involvement of low-grade students, especially grade 1 students. The application of this method has proven to be effective in increasing the number of students who are actively learning, especially among students who previously struggled with arithmetic. In counting, students in grade 1A showed improvement, especially in remembering the sequence of numbers 1 to 10 and performing simple summation using songs and hand movements. The implications of this study confirm that the application of creative teaching methods that are appropriate to the stages of children's cognitive development in elementary school, such as the singing method, can be a powerful alternative in teaching mathematics at the elementary level. This approach not only makes it easier for students to understand the concept of numbers in a more engaging way, but it also helps in internalizing ideas through more meaningful activities. However, it is not optimal if the singing method is used without the support of media or other learning strategies. Diverse student responses suggest that singing methods need to be combined with other learning approaches to develop students' engagement and understanding of numeracy better. Practically, teachers are encouraged to integrate singing methods into the daily learning process by adapting materials, patterns, and movements that suit students' abilities. For subsequent researchers, it is recommended to develop similar research by reaching more subjects, applying different approaches or methods, and evaluating the effectiveness of singing methods over a longer period of time on students' numeracy skills.

### **Authors' contribution**

- **Conceptualization:** Viola Prisma Anggi Armadila
- **Data curation:** Viola Prisma Anggi Armadila
- **Formal Analysis:** Viola Prisma Anggi Armadila
- **Funding acquisition:** Viola Prisma Anggi Armadila
- **Investigation:** Viola Prisma Anggi Armadila
- **Methodology:** Viola Prisma Anggi Armadila
- **Project administration:** Viola Prisma Anggi Armadila
- **Resources:** Viola Prisma Anggi Armadila
- **Software :** Viola Prisma Anggi Armadila
- **Supervision:** Sigit Dwi Laksana; Anip Dwi Saputro
- **Validation:** Sigit Dwi Laksana; Anip Dwi Saputro
- **Visualization:** Viola Prisma Anggi Armadila
- **Writing – original draft:** Viola Prisma Anggi Armadila
- **Writing – review & editing:** Viola Prisma Anggi Armadila

*All authors have read and agreed to the published version of the manuscript.*

### **Ethics Statement**

*This research involved human subjects who had given informed consent to participate. All participants received treatment in accordance with their rights, dignity, and applicable research ethics principles.*

### Data availability statement

All data sets were generated or analyzed in the current study.

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### Conflicts of Interest

The authors declare no conflicts of interest.

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