

**IMPROVEMENT OF PROCEDURAL MEMORY IN  
BEGINNERS FOR DEVELOPING EARLY LITERACY SKILLS  
IN MALAYALAM ALPHABET THROUGH CORPOREAL  
ACTIVITIES**

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**By**

**JESVIN BEN BENTROCK**

**(Register No: AM20HCD006)**

**Department of Home Science**

**St. Teresa's College (Autonomous)**

**Ernakulam**

**June 2022**

## **CERTIFICATE**

This is to certify that the thesis entitled “*Improvement of Procedural Memory in Beginners for Developing Early Literacy Skills in Malayalam Alphabet Through Corporeal Activities*” is a research work carried out by JESVIN BEN BENTROCK under my guidance and supervision.

**Signature of head of the department**

**Signature of the Guide**

**Dr. N Dhanya**

**M.Sc., M. Phil., Ph. D.,**

**MA, M. Phil., MBA**

Assistant Professor

Department of Home Science

St. Teresa’s College,

Ernakulam

## **DECLARATION**

I hereby declare that this dissertation entitled “Improvement of Procedural Memory in Beginners for Developing Early Literacy Skills in Malayalam Alphabet Through Corporeal Activities” is a bonafide record of research work done by me under the guidance and supervision of Dr. N Dhanya and has not been previously submitted by me for the award of degree, diploma or recognition elsewhere.

Place: Ernakulam

**JESVIN BEN BENTROCK**

Date: 06/06/2022

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# **INTRODUCTION**

# CHAPTER – 1

## INTRODUCTION

*“ An art education helps build academic skills and increase academic performance, while also providing alternative opportunities to reward the skills of children who learn differently. “*

**-Gavin Newsom**

A child’s development begins by learning in his/her first years. According to Bandura (1977), children learn and imitate behaviours they have observed in other people and this starts even in the early developmental stages of a child and in this learning process language is one of the main factors which plays an important role for the development. To communicate and understand others, language is vital and it is an essential part of human communication and language allows us to share ones ideas, thoughts and feelings.

In our world there are different languages and one’s mother tongue is what that makes a person more comfortable in expressing himself or herself. According to Leonard (2005), mother tongue is the first language or dialect that a person has been exposed to from birth or within the critical period. Mother tongue is a part of one person’s personal, social and cultural identity. Another impact of the first language is that it brings about the reflection and learning of successful social patterns of acting and speaking (Lera, 2001).Language can interfere in the child's cognitive development also. Noormohamadi (2008), in his journal reports a study of Schick, de Villiers, and Hoffmeister (2002) which explains that language delays typically observed in deaf children are causally related to delays in major aspects of cognitive development.

Mother tongue not only stimulates children’s confidence but also creates awareness of their individual and cultural identity. It facilitates learning and adoption of other languages, creates job opportunities in adults and keeps families tightly joined. Also it is said that to improve the quality of education, language policies need to take account of mother-tongue learning. Models of education which ignore the mother tongue in the early years can be unproductive, ineffective and have a negative effect on children’s learning. The importance of mother tongue is studied because when children develop their mother tongue, they are simultaneously fostering a whole host of other essential skills, such as critical thinking and literacy skills (Nishanthi, 2020).

Literacy skill is the skill or ability to read, write, speak and listen in a way that lets us communicate effectively. Literacy skills are of vital importance for all people and enable children to get to know the life and interact with their environment and other people, leading the way to a successful career. Starting primary school is certainly a new chapter and an exciting step for both students and their families. First-grade students attending elementary school which is the beginning of a tiring process for both teachers and students are equipped with the speaking skill that is the most natural communication tool in a language. The hearing and speaking skills, which are essential for teaching, are two basic elements of basic language skills and they have an important role in the acquisition of two other basic skills of reading and writing which come under literacy skills (Ahmet, 2018).

Kerala is a state on the Malabar coast of India that is the southern part of India. People in this state use Malayalam language which is most widely spoken language and is also the official language of the state. Sadasivan (2000), once stated that One folk etymology derives *Kerala* from the Malayalam word *kerā* 'coconut tree' and *alam* 'land'; thus, 'land of coconuts' which is a nickname for the state used by locals due to the abundance of coconut trees (Victor *Ret.al.*,2011).

To become more efficient in one's mother tongue the person should get early intervention and get more opportunity. It is important to help young learners to develop an affirmative spelling awareness. Early intervention helps the child to attain literacy skills in the language. Both reading and writing skills are important to form better language development. In Kerala children find more difficulty in writing skills in their mother tongue Malayalam. Gafoor and Remia (2012), commented that students' spelling difficulties if monitored and identified early during the schooling will help in giving appropriate support in a consistent way and the study shows that most difficult area in writing Malayalam, for beginners, is signs - both vowel signs and diacritic signs. It was also noted that substitution in letters and words in large extent, and omission in lesser extent, causes spelling errors. Teachers have also mentioned that children show more spelling errors in Malayalam. Due to its lineage deriving from both Sanskrit and Tamil, Malayalam alphabet has largest number of letters, at least among Indian languages. This factor makes learning to spell Malayalam more difficult and makes it prone to spelling errors, than among other phonetic languages. The variety of letters confuses young children at early stage of language learning.

According to Newsom (2011) art education helps to build academic skills and academic performance. Art instruction helps children with the development of motor skills, language skills, social skills, decision-making, risk-taking, and inventiveness. Visual arts teach learners about colour, layout, perspective, and balance: all techniques that are necessary in presentations (visual, digital) of academic work. The present study gives more focus on the corporeal skills and activities of pre-schoolers in Kerala to improve the literacy skills in Malayalam.

Corporeal or kinesthetic activities (also known as hands-on activities) are fantastic method to learn reading and spelling. The term kinesthetic refers to touching, doing or being physically active. Educators have found that kinesthetic involvement in an experiment or demonstration can engage students in a powerful way. In a study of Beth (2007), regarding the impact of art and literature based approach on writing and reading skills, it was proved that there is a complementary relationship between the language of art and language of words which links the ability to visualize with the development of solid reading and writing skills and recognize the diverse learning styles of children, and by this educators and administrators are being called upon to recognize the vital role that the art can play in the literacy learning of all students.

One important skill which the corporeal or kinesthetic activities stimulate is motor skill. Motor skills refers to the movements of the body which involves large muscles examples include running, jumping, galloping, hopping, kicking, throwing, and catching are among the many motor skills that seem to appear one day in the child's collection of newly found behaviours. Puru, (2021) states that without motor skills you would not be able to do anything productive, small infants do not have motor skills in the beginning, so you can imagine what all functions you may be able to do. Motor skills are developed in children from time to time.

There are two types of motor development, gross motor skills and fine motor skills. Gross motor skills focus on the large muscles present in the body whereas fine motor skills are based to focus on the fine movements and controls that take place. The tool of the present study has given more importance to the fine motor skills and the activities incorporated in the activity book give more emphasis to the fine motor skills of beginners.

According to Madison *et.al.*,(2021), learning to write is challenging for young children, as they must integrate their still-developing fine motor skills with an understanding of written language to produce a mark that has meaning. Complicating things more is the fact that children

are often asked to produce a variety of written products with varying task demands (e.g., writing single letters vs. combining these letters to form entire words or sentences). Fine motor skills include behaviours like manipulating small objects, cutting with scissors, drawing, tracing, and copying figures, and these skills have been linked to writing such that children with higher levels of fine motor skill proficiency perform better on writing assessments than do their peers who are lower in fine motor skill proficiency (Daly et al., 2003; Gerde et al., 2012). Especially in a classroom context, fine motor skills feature prominently in young children's daily activities – in fact, an observational study of Head Start and kindergarten classrooms showed that between 27 percentage to 66 percentage of the school day is devoted to fine motor activities (Marr et al., 2003).

Madison *et.al.*, (2021), in his study states that in the context of fine motor skills and school performance, a child who possesses higher levels of mastery of basic motor skills (i.e., grasping a pencil, writing letters) may be better able to focus his/her attention on higher-order concepts like spelling words correctly or composing sentences (Cameron et al., 2012; Medwell et al., 2009). In contrast, a child low in fine motor skills may struggle with these more basic classroom activities and thus be less able to allocate his or her attention to the content of lessons or the execution of more complex tasks. Difficulties with executing the fine motor skills associated with writing inherently limit both the amount of text that children can produce and the speed with which they can produce it (Berninger, 1999; Graham et al., 2012).

The fifty one activities explained in the activity book (tool of the study) express how the fine motor activities can help in improving a child's procedural memory and literacy skills. Improvement in procedural memory and fine motor skills will serve as a remedy to overcome these difficulties.

According to Buffington, Morgan (2019), procedural memory is a type of implicit memory system that supports the acquisition of cognitive and motor skills as well as habits (Ashby, Turner, & Horvitz, 2010; Eichenbaum, 2011; Eichenbaum & Cohen, 2001; Henke, 2010; Morgan-Short, 2013b; Squire & Dede, 2015; Tulving, 1985; Ullman, 2004; 2015; 2016). For example, some motor skills supported by procedural memory include learning to shoot a basketball or to drive a car, and some cognitive skills include learning a new math technique or how to solve a Rubik's cube. Procedural memory may be described by a number of (neuro) cognitive characteristics. By 'implicit' it is meant that learning in procedural memory does not involve conscious awareness

(Tulving, 1985). For example musicians and professional athletes are said to excel, in part, because of their superior ability to form procedural memories. Procedural memory is also important in language development, as it allows a person to talk without having to give much thought to proper grammar and syntax. (Zimmermann, 2014).

Procedural memory should underlie the learning and processing of sequences and rules in language, perhaps especially those that are probabilistic rather than deterministic. The system may be particularly important in “learning to predict” in language, such as predicting the next item in a sequence or the output of a linguistic rule. Only rules or sequences that are implicit should be learned by procedural memory. Given that grammar involves largely implicit rules, both probabilistic and deterministic, particularly ones that involve (hierarchical) sequencing, procedural memory should play a major role in this aspect of language (Ullman, 2016). These sequencing is very important in writing and also to do the kinesthetic activities. Even in activities like brushing, driving etc procedural memory is very important.

Physical movement energizes the brain by increasing blood flow, oxygen, and nutrients. It increases alertness, attention, and motivation, more nerve cells bind together, and the chemicals released at the synapse help "fix" memories and improve recall. So the procedural memory can be improved mainly through kinesthetic activities.

This study therefore makes an effort to develop kinesthetic activities and compile fine motor activities to improve the procedural memory in writing Malayalam alphabets. So this study will be useful for parents, teachers and remedial educators to instill early literacy skills in Malayalam language.

### **Relevance of the topic**

Children are the assets of our world. So holistic development of these children is very essential for the better future of the world and education or literacy is an important factor in the development of the child. Learning is essential for attaining education but different people poses different learning styles like visual, auditory, kinesthetic and tactile. If children fail to recognize or if children don't get a proper resources for his/her appropriate learning style, children may find it difficult to learn things. This study is relevant since it encompasses all three styles of learning –

visual auditory and kinesthetic and these kinesthetic learners are the ones who face difficulties learning Malayalam alphabet more

Taking this in mind, the topic “*Improvement of Procedural Memory In Beginners for Developing Early Literacy Skills in Malayalam Alphabet Through Corporeal Activities*” was taken up for investigation.

### **Aim**

To develop kinesthetic (corporeal) activities to improve the procedural memory of beginners.

### **Objectives**

The main objectives of the study are as follows.

#### **General objectives:**

- To check the current awareness of writing Malayalam alphabet among selected children.
- To develop activities for improving fine motor skills in children.
- To provide repetitive activities to reinforce the procedural memory in the formation of alphabet in Malayalam.

#### **Specific objectives:**

- To create kinesthetic activities (for Malayalam vowels and consonants) for the improvement of procedural memory and to compile the activities into a workbook and develop an instructional CD which encompasses all three styles of learning – visual, auditory and kinesthetic.
- To test the efficacy of evolved workbook and CD in improving the formation of Malayalam alphabet.



# **REVIEW OF LITERATUR**

## CHAPTER -2

### REVIEW OF LITERATURE

The review of literature of the research titled '*Improvement of Procedural Memory in Beginners for Development of Early Literacy Skills in Malayalam Alphabet Through Corporeal Activities*' are explained under the following titles :

- 2.1 Importance of procedural memory
- 2.2 Effect of corporeal activities in children
- 2.3 Significance of fine motor skills in beginners
- 2.4 Difficulty and significance of Malayalam language

#### **2.1 Importance of Procedural Memory**

One's life is abounding with large and small activities and these activities in our daily life involve many steps. To recall each step one should have a proper memory system. According to Radvansky and Tamplin (2012) memory refers to the mental representations and processes involved in the retention of information. In our human brain there are four important memory types which includes – working memory, sensory memory, short-term memory and long-term memory. The long-term memory in which the information last a long time is has two classification that is, Explicit memory and implicit memory and the procedural memory which helps in recalling each steps in an activity comes under implicit memory.

Procedural memory at the most basic level of the monohierarchy contains memories for how to perform activities, including stimulus–response associations. Examples of procedural memories are knowledge of how to ride a bike or drive a car, how to play the drums, how, to solve a puzzle, and how to walk. The procedures contained here can be activated without conscious

awareness. Thus, the procedural knowledge that governs driving a car is applied with minimal attention to the specific sequence of steps needed to do this. As this observation implies, information in procedural memory is often difficult to articulate, but lasts for quite a long time. In addition, procedural knowledge is relatively resistant to deliberate changes to add, modify, or rearrange various components (Radvansky and Tamplin, 2012). Since this memory functions without conscious awareness, it is not only important for daily activities like brushing teeth but also important for reading, writing and language skills. Thus procedural memory plays a great role in communication, as it allows a person to talk without having to give much thought for proper grammar and syntax. According to Stefaniak's *et.al* article (2021) procedural memory could be more involved in the acquisition of word lexicon (Kemeny and Lukacs, 2021), as well as the selection of words while inhibiting concurrent words (Crosson, 2021), which could support the process to find meaning (Stefaniak *et.al*, 2021).

According to a study conducted on 2016 on Seventy-six typically developing children between 5 and 7 years of age, by Mimeau, Coleman, Donlan on the topic 'The role of procedural memory in grammar and numeracy skills', has found that procedural memory could predict calculation above and beyond age and working memory. Researchers could examine whether children who express difficulties in numeracy also show deficits in procedural memory. They could also determine whether aspects of numeracy not assessed in the present study, such as problem solving, which requires both grammatical and numerical knowledge, are associated with procedural memory. This may help better understand the function of cognitive processes in the development of numeracy in children. Similarly Clark and Lum (2017) through a study suggested that procedural memory has been proposed to underlie the acquisition of a range of skills including grammar, reading, and motor skills. In developmental language disorder (DLD) it has been suggested that procedural memory problems lead to the difficulties with grammar in the group.

On 2001, Ulman proposed the 'Declarative/Procedural model' and according to this model, procedural memory would be involved in the manipulation of grammar, including syntax, morphology, and phonology while declarative memory would sustain the mental lexicon, meaning, word sounds, and the acquisition of irregular grammatical rules. Based on this model, hypotheses about the origin of language impairment emerged (Stefaniak, Caillies and Kemeny, 2021). Memory disorder may also result in the formation of diseases like memory deficits,

neurodegenerative diseases including Alzheimer disease, svPPA (Semantic Variant Primary Progressive Aphasia) and Parkinson disease.

## **2.2 Effect of Corporeal Activities in Children**

According to Cambridge Dictionary the word corporeal means something relating to the body, physical and not spiritual. Physical activities involve any body part and it helps children to improve their motor skills. Gross motor skills like running, jumping, swimming etc and fine motor skill which involves small muscles like holding a pencil or scissors improves their body functioning, eye-hand coordination etc. Alves and Alves (2019) in their study suggest that, physical activities does not appear to impair the child's linear growth and contributes to the ideal shaping of bone and muscle tissues, ensuring possible beneficial effects throughout life.

In another study, Gunter, Almstedt and Janz (2012) were said that, to be effective and sustained, physical activity must be woven into the fabric of society, which requires physical and social environmental supports for increasing active lifestyles. To date the most effective interventions to enhance skeletal development have been school-based. However, the observational studies provide strong evidence that simply increasing moderate-to-vigorous activity may also contribute to improving bone health. Thus, the charge to researchers is to take the next difficult steps and test effective translational strategies that can be broadly disseminated in schools and communities to positively influence physical activity behaviours and subsequent life-long skeletal health.

If children show less interest in doing exercises elders can encourage them in doing physical activities by dancing, by doing crafts (like using pencils and doing works with scissors etc), playing games, by doing action song etc. There are some studies which emphasis the importance of dancing. A study which point out the importance of dancing comments that, dance is the psychotherapeutic use of movement as a process which furthers the emotional, social, cognitive, and physical integration of the individual. Demonstrated by the approach as effective method that increases time physical activities without restricting the time of physical education lessons or academic daily sections. Requiring the health care and educational system to adopt the approach to secure the demands of children grow under the impact of 'Prolonged Periods

Classroom Settings' support by Algerian studies as sedentary time consequence of further health risk. It also improves fundamentally bodily/kinesthetic intelligence that must be fulfilled during first-graders primary school tutoring program.

It is also said that physical activities and exercises also improve the functioning of hyperactive children. In a study of Golubović S *et.al* (2014) it is said that improvements are shown within the group of hyperactive children with regard to coordination of the whole body, trunk strength and agility were statistically significant through physical exercises.

### **2.3 Significance of Fine Motor Skills in Beginners**

As per Syafril Syafrimen *et.al.*, (2018) study fine motor skill is the ability to control movement through activities coordination of nervous system, fibril, and muscles such as fingers and hands. Fine motor skill is also seen as a very important factor in the process of developing cognitive abilities in early childhood. Fine motor skills are one of the important components in children's activities at school. About thirty to sixty percent of the day, the teacher needs to provide motoric tasks to the children in school, where understanding motor skills can help improve students' abilities in the academic field (Chin Kai Lin, 2014). At the age of 3 years, children have the ability to grab objects with thumb and index finger, at the age of 4 years the fine motoric in children has begun to develop, such as building high towers with bricks toys, in 5 years old the child's motor skills will have developed to a much higher degree, fingers, arms, and hands all moving under the eye-hand coordination, and 6 years old children can tying shoelaces, and dressing up (James K. H & Engelhardt L, 2012; James, 2010; Santrock, 2007; Wilhelm I. Prehn-Kristensen A & Born J, 2012). Fine motor skills development deals with the manipulation of manual objects, such as writing, weaving ropes, arranging beams, tying shoelaces, flipping pages of books, cutting with scissors, playing dough, and making shapes from folding paper (Amel E Abdel Karim, 2015; Houwen, 2009; Laura, 2013; Mayes S D, 2009; Xia Wei, 2016). In addition, fine motor skills can be activities such as cutting with scissors, colouring, drawing with pencils and crayons (Punum Bhatia Alan Davis & Ellen Shamas-Brandt *et al*, 2015). Thus, the teacher needs to understand the children fine motor skills development while in school. As per

Syafril Syafrimen *et.al.*, (2018) Barnett L M van Beurden *et.al.*, (2009); Walter C (2011) suggest that Some experts find that boys tend to be more advanced than girls.

Another significance of Fine motor skills is, it show children's creativity (McClelland, 2011). Creativity is the factor that helps a person to create something new and makes him more unique. A child with good fine motor skills finds it easy to exhibit his/her views and thoughts to the society. What happens if children lack in this motor skill? In a study by Cameron Claire E *et.al.*, (2012) it point outs that many kindergarteners struggle to master the foundational behaviours that enable them to successfully engage in classroom learning (Rimm-Kaufman, Pianta, & Cox, 2000). This is reflected in skill gaps at school entry between children from socio-demographically advantaged and disadvantaged backgrounds (Grissmer & Eiseman, 2008). As per Cameron Claire E *et.al.*, (2012) early childhood professionals and curricula have long emphasized the importance of motor development (Bredenkamp & Copple, 1997; Lillard, 2005), and kindergarten teachers rate fine motor skills as a key aspect of school readiness (Johnson, Gallagher, Cook, & Wong, 1995). By kindergarten, fine motor tasks are better predictors of reading achievement than gross motor tasks (Wolff, Gunnoe, & Cohen, 1985). Children with strong fine motor skills measured with a composite demonstrate better mathematics performance at kindergarten entry and make greater mathematics gains over the year (Luo, Jose, Huntsinger, & Pigott, 2007; Son & Meisels, 2006).

According to Sutapa Panggun *et.al.*, (2018) suggests that the development of fine motor skills and logical mathematical intelligence needs to be done as early as possible. This is because the development of motor skills and logical-mathematical intelligence requires long concentration . A 4-year-old child that do not have good fine motor skills needs assistances in order to be able to coordinate the visual and motor movements, which involves the coordination of the eyes, fingers, and feet. He also states that the games of play dough and puzzles have a significant effect on fine motor skills.

According to Ziegler Albert, Stoeger Heidrun (2010) fine motor skills are basic for individual development, and their absence would render the attainment of a number of milestones in early child socialization unthinkable. As per Ziegler Albert, Stoeger Heidrun (2010) Vacc, Vacc, and Fogleman (1987) found, for example, that fine motor skills among pre-school aged children can best predict later performance on standardized achievement tests in the first grade. Further

studies confirm correlations between fine motor skills and scholastic performance up through, at the very least, the end of primary school.

Fine motor skill can also influence ones intelligence. A study by Klupp Stephanie, Möhring Wenke, Lemola Sakari, Grob Alexander (2021) suggest a close relation between fine motor skills and intelligence in children with and without ADHD. This in developing children at the age of kindergarten (e.g., Cameron et al., 2012) proposes that fine motor skills continue to be an indicator for cognitive skills across childhood until early adolescence. Furthermore, the study highlights stronger associations between fine motor abilities and intelligence in children with ADHD – a developmental disorder characterized by attention deficits and being less perceived for motor difficulties – as compared to typically developing children.

#### **2.4 Difficulty and Significance of Malayalam Language**

Malayalam, the official language of Kerala, is classified as a South Dravidian language. About 31.8 million people consider Malayalam as their mother tongue. Possessing an independent written script, it also has an enriched literature. The term 'Malayalam' is of comparatively recent origin. To begin with, it denoted the land itself. It is probable that the term is the resultant of a combination of two words, mala meaning, mountain and alam meaning the land or locality (which lies alongside the mountain). Subsequently the synonyms Malayalam and Malayalam came into being as denoting the language of the Malayalam and finally the name of the land itself was taken over as the name of its language. Influence of Sanskrit is most prominent in Malayalam in almost all linguistic areas. From Sanskrit, thousands of nouns and hundreds of verbs are borrowed into Malayalam. Some items of basic vocabulary also have found their way into Malayalam from Sanskrit. (Girish P M, 2015)

Malayalam with a great tradition and being used by millions of adults and young children for their learning and development has not yet started to systematically develop a teaching–learning procedure for fundamental skills of reading and writing that suits its peculiarities.(Gafoor K & Remia K R, 2012)

According to Gafoor& Sajeew, 2009 in a study by Gafoor K & Remia K R (2012) A study has found that 1/5 upper primary students have spelling difficulty, 1/3 of them had difficulty in

identifying letters in Malayalam alphabet, more than 1/3 of them using vowel symbols improperly. This indicates that students fail to master alphabet during the explicit teaching of it in the lower grades. Lower primary teachers, in a pilot interview for this study, revealed that a noticeable share of their students commit a lot of errors in spelling. Teacher education practice in Kerala demonstrates that, even today when it comes to illustrate the type of writing difficulties students encounter in the early phase of learning Malayalam, teacher educators and texts refer more to errors from English than from their mother tongue. Due to its lineage deriving from both Sanskrit and Tamil, Malayalam alphabet has largest number of letters, at least among Indian languages. This factor makes learning to spell Malayalam more difficult and prone to spelling errors, than among other phonetic languages.

Other studies also point out the different in Malayalam language. In early years children show more difficulty in writing this language than reading (because of the complexity in language). A similar study by Vishnu V K, Sreelakshmi and Nandhu, (2015) also point out that agglutinative language like Malayalam is rich in morphological aspects in which identifying the morphological suffixes of verbs and nouns is a tough task

The variety of letters confuses young children at early stage of language learning. Errors are an inevitable feature of learning. They provide valuable insight into the language learning process. So by analyzing the errors, one could build up a picture of the features of language that cause learning problems. Once the problems are understood in right perspective remedial measures could be planned. (Gafoor K & Remia, 2012).



# **METHODOLOGY**

## **CHAPTER- 3**

### **METHODOLOGY**

Methodology is the complete structure of the research study; the size and sample methods, the practices and techniques utilized to collect data and the process to analyse data (Bowling, 2002). So the methodology adopted for the study “*Improvement of Procedural Memory in Beginners for Developing Early Literacy Skills in Malayalam Alphabet Through Corporeal Activities*” are as following:

3.1 Selection of Area

3.2 Selection of Sample

3.3 Selection of the Tools

3.4 Development of Tools

3.4. 1 Questionnaire for pre-schoolers to analyze their understanding in Malayalam.

Remediation Tools Developed-

3.4.2 An activity book for pre-schoolers to improve procedural memory (self designed).

3.4.3 Instructional CD to form better understanding of activity book (incorporated in activity book).

3.4.4 Questionnaire for teachers to know their feedback on activity book developed (self designed).

3.5 Conduct of the Study

3.6 Analysis and Interpretation

### **3.1 Selection of Area**

The selection of area is an unavoidable part of a study. The area selected for the present study was Thodupuzha in Idukki district. Idukki is a state in Kerala where people talk Malayalam as their mother tongue. For educational purpose Idukki has been divided into two educational districts: Thodupuzha and Kattappana. These are again divided into seven educational sub districts and this is done to bring efficient and effective school administration in the district. In Idukki there are 478 schools in total and from this 211 schools are from Thodupuzha.

The school selected for the development of the tool was De Paul Public School in Thodupuzha. This school is affiliated to Central Board of Secondary Education, Delhi. Many children from different parts of the city study in the school.

The present study focused on the procedural memory and fine motor skills for developing literacy skills in pre-schoolers in Malayalam writing. Since people in Kerala speak Malayalam, schools in Kerala were more suitable for the sample selection. Since Thodupuzha has the history of providing best education in Idukki district and researcher can reach out there easily than other areas, Thodupuzha was considered as the pre-eminent area for selecting suitable sample.

### **3.2 Selection of Sample**

A sample refers to a smaller, manageable version of a larger group. It is a subset containing the characteristics of a larger population. Samples are used in statistical testing when population sizes are too large for the test to include all possible members or observations (Will, 2022). In the present study the method used for sampling was 'Purposive Sampling'. A purposive sample is a non-probability sample that is selected based on characteristics of a population and the objective of the study. It is also known as judgmental, selective, or subjective sampling. This type of sampling can be very useful in situations when you need to reach a targeted sample quickly, and where sampling for proportionality is not the main concern (Crossman, 2020).

The sample chosen for the study had 10 preschool children (6 girls and 4 boys) between the age group of 3-6 years. The children were selected from Thodupuzha – De Paul Public School. This was because there were no other institutions working as preschool since it were the summer holydays and De Paul Public School was still

working and three teachers were there to look after the children. Before the pandemic many children came there but during the pandemic the number of attending this preschool became very less. Two of the children from the group passed LKG and others were pre-schoolers.

### **3.3 Selection of the Tools**

According to Ebrahim (2016), “Research Tools” are vehicles that broadly facilitate research and related activities. “Research Tools” enable researchers to collect, organize, analyze, visualize and publicized research outputs. The tools used for the present study are as included :

1. Questionnaire for pre-schoolers to analyze their understanding in Malayalam.

Remediation Tools Developed -

2. An activity book for pre-schoolers to improve procedural memory (self designed).
3. Instructional CD to form better understanding of activity book (incorporated in activity book).
4. Questionnaire for teachers to know their feedback on activity book developed (self designed).

### **3.4 Development of Tool**

#### **1. Questionnaire for pre-schoolers to analyze their understanding in Malayalam.**

The self designed pre-test was based on the Malayalam curriculum of LKG grade (Appendix I). The test tool consisted of five questions to understand the current activity performance level and knowledge (in Malayalam). Questions were like: Identify the Malayalam letters, Join the letters with lines in correct order, Circle the correct letter, Match the following and Join the dots and form letters. The results (pre-test) were noted so that the researcher could analyze the improvement and also test the efficacy of two main tools that are : activity book and the instructional CD.

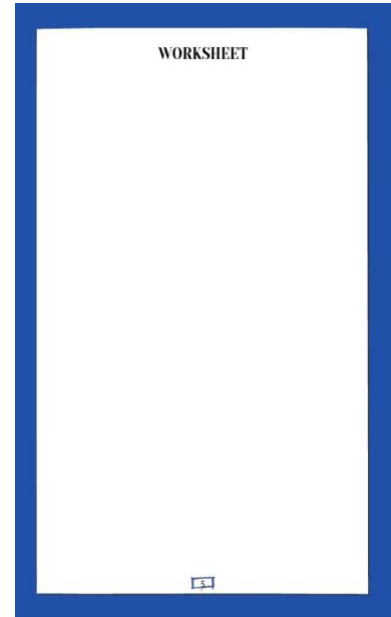
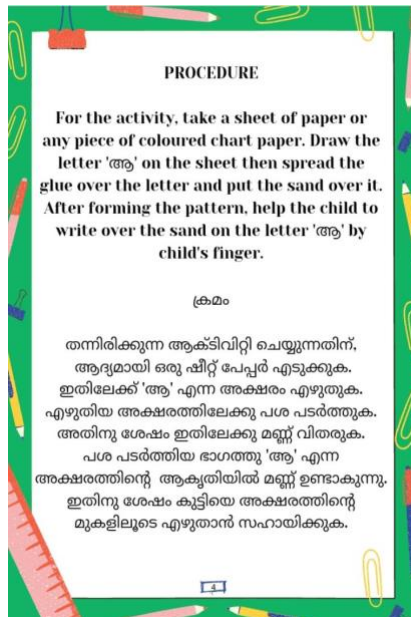
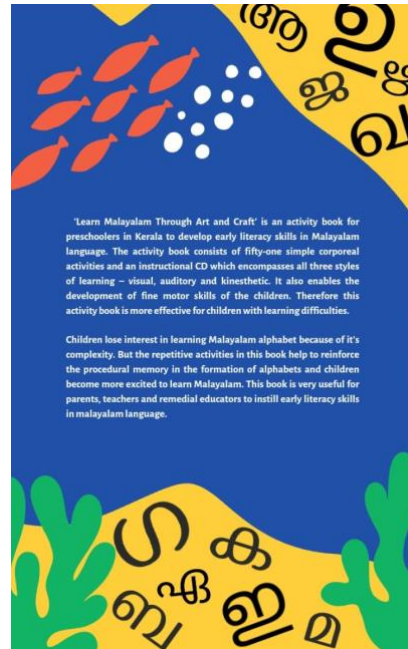
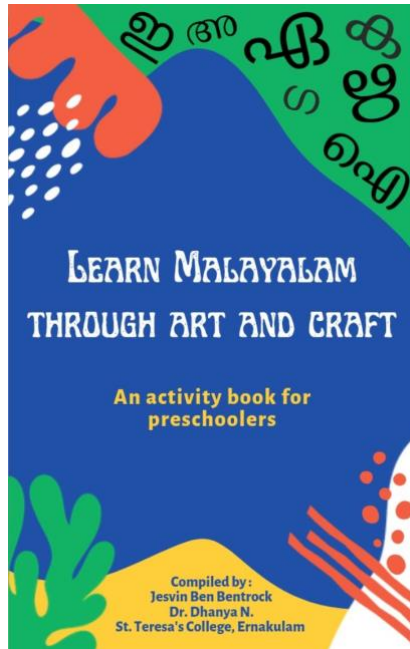
The test was designed as a three point rating scale as follows:

<b>Rating scale</b>	<b>Scores assigned</b>
Excellent	3
Very good	2
Good	1

The test was out of fifteen and using the above rating scale children showed scores between 7-12 out of 15. Before introducing the activity book, subjects were given the test and the results were noted. Then these were converted into percentage, to analyze the children's improvement. The same test was considered as the post-test, and this helped the researcher to compare the efficacy of the activity book and instructional CD.

## **2. An activity book for pre-schoolers to improve procedural memory (self designed).**

According to Ashley (2022), activity books are a type of book that feature a variety of topics, skills, and areas of interest, like colouring or puzzles which are not only entertaining for kids, but are also educational. The self designed activity book consists of fifty-one different types of simple but effective activities. The activities are designed for the Malayalam vowels and consonants. There are fifteen vowels and thirty six consonants and activities for these were included in the book. A copy of the book is given in Appendix II. Lastly an instructional CD has been incorporated in the activity book to enable easy understanding of each activity.



**Plate 1**

**A Glimpse of the Activity Book Developed**



**Plate 2**

**Helping subjects in doing activities and conducting the pre-test**



**Plate 3**

**Activities from activity book**

### **3. Instructional CD to form better understanding of activity book (incorporated in activity book).**

The CD consists of some instructions so that the users get clarity about the activities in the activity book. It had fifty-one activities and also had vocal explanations to it.

### **4. Questionnaire for teachers to know their feedback on activity book developed (self designed).**

A questionnaire is a research device or instrument that is made up of a series of questions which are closed-ended or open-ended. The goal is to collect relevant data from respondents which can then be used for a variety of purposes (Ndukwu, 2020). The questionnaire was self designed by the researcher. The main aim of the questionnaire was to get the teacher's opinion and suggestions about the activity book and instructional CD. The questionnaire consisted of seven closed ended and one open ended questions.

#### **3.4 Conduct of the study**

**Phase I** : Development of a tool to assess the performance level of the beginners (pre-test).

**Phase II** : Development of a workbook and a CD to provide certain instructions about the procedure of doing the activities.

: Preparation of a questionnaire to collect the feedback from teachers.

**Phase III** : Assessing the current level of performance in writing.

: Providing the workbook and CD to the selected children and making them do the activities.

: Reassessing the performance of the beginners.

**Phase IV** : Assessing their improvement by a post test result.

: Expert evaluation and application of activities in the regular school curriculum.



### **Phase I : Development of a tool to assess the performance level of the beginners (pre-test).**

The self designed pre-test was carefully arranged by the researcher based on the Malayalam curriculum of LKG grade. The test tool consisted of five questions to understand the current activity performance level and knowledge (in Malayalam) of each child. The questions are categorized as – Skills of respondents on letter identification, Knowledge of respondents on arrangement of Malayalam alphabet, Knowledge of respondents on letter recognition, Skills of respondents on word and picture recognition, Aptitude of respondents on writing skills. The pre-test was done in one week before introducing the activity book.

### **Phase II – consists of two steps:**

1. Development of a workbook and a CD to provide certain instructions about the procedure of doing the activities.
2. Preparation of a questionnaire to collect the feedback from teachers.

#### **1. Development of a workbook and a CD to provide certain instructions about the procedure of doing the activities.**

The self designed activity book consists of fifty one different types effective activities. The activities are designed for the vowels and consonants in Malayalam. Fifteen vowels and thirty six consonants and each activity for these are included in the book. The main aim of the activity book was to improve the procedural memory and fine motor skills of beginners through corporeal (kinesthetic) activities in Malayalam. One activity is provided for every letters. Main specialties of activities are, they are simple and the materials for the activities can be easily assessed. The pictures of similar activities are attached for each letter. For each letter a procedural sheet and a worksheet has included. Procedural sheet explains how an activity should be undertaken. Then the worksheet is to deliver an area to practice the activity.

The CD is made up of some instructional videos which will help the users to get a clear idea (what all materials used, how each steps should be done correctly etc) about the activities. Procedure of each activity is verbally explained in the CD. The music playing throughout the video helped children to get motivated to do the activities.

## **2. Preparation of a questionnaire to collect the feedback from teachers.**

The questionnaire which was self designed by the researcher consisted of seven closed ended and one open ended questions. The main aim of the questionnaire was to get the opinion of experts (teachers) who are teaching the children from 3-6 years. The evaluation was done by five teachers from the kinder garden section of De Paul Public School, Thodupuzha.

### **Phase III – consists of three steps:**

1. Assessing the current level of performance in writing.
2. Providing the workbook and CD to the selected children and making them do the activities.
3. Reassessing the performance of the beginners.

#### **1. Assessing the current level of performance in writing.**

The current level of performance of 10 children was analyzed through the pre-test. The two 6 years old children showed better performance than other 3-5 years old ones. Out of fifteen children scored from eight to twelve. After the test results were converted into percentage in order to analyze further.

#### **2. Providing the workbook and CD to the selected children and making them do the activities.**

To analyze the effectiveness of the two main tools, 10 children were selected from the pre school section of De Paul Public School, Thodupuzha in Idukki district. After conducting the pre-test, the researcher by the help of the teachers in the school helped children to perform ten different activities from the activity book. Some of the activities were colouring the letter activity, sticking thread activity, sand paper activity, draw me with letter activities (pencil drawing), stone activity, sticking paper ball activity, paper pin activity and thermocol ball activity. The activities and colourful materials for the activities made them excited and thrilled to do the activities.

Video in CD were presented to both teachers and children. This helped them to realize what all things they should do to make the activities

### **3. Reassessing the performance of the beginners.**

As mentioned in phase I, after helping the children to execute some activities in the activity book (tool), again on the next day the same pre-test was given as post-test to check their improvement and understanding in Malayalam alphabet. The results of both tests (pre-test and post-test) were noted so that the researcher could compare it and analyze the improvement and to test the efficacy of the main two tools that are : activity book and the instructional CD.

#### **Phase IV – consists of two steps:**

1. Assessing their improvement by a post test result.
2. Expert evaluation and application of activities in the regular school curriculum.

##### **1. Assessing their improvement by a post test result.**

The percentages of results of the pre-test and post-test are compared by a t-test to assess the improvement in children's literacy skills.

##### **2. Expert evaluation and application of activities in the regular school curriculum.**

A questionnaire was developed to carry out the expert evaluation. It was self designed by the researcher. Five teachers evaluated the tools. Activities can improve the child's performance and in the regular school curriculum such activities are necessary. Since the resource materials of the activities in activity book can be easily assessed.

### **3.6 Analysis and interpretation**

The results of both pre-test and post-test are interpreted in the term of percentages. To investigate the hypothesis of the study parametric test - t-test was used. Paired t-test was conducted to check the effectiveness of the activity book and instructional CD

The figure given below depicts the research design of the study entitled, “*Improvement of Procedural Memory for Developing Early Literacy Skills in Malayalam Alphabet in Beginners Through Corporeal Activities*”



**Figure – 1**

**Research Design**

## **RESULTS AND DISCUSSION**

## CHAPTER - 4

### RESULTS AND DISCUSSION

The results obtained from the analysis of the data collected and its discussion on the present study entitled “*Improvement of Procedural Memory in Beginners for Developing Early Literacy Skills in Malayalam Alphabet Through Corporeal Activities*” explained under this chapter. For a broad understanding and clarity the results and discussion is discussed under the following sub headings:

4.1 General Information of the Selected Children.

4.2 Development of Activity Book.

4.3 Development of Instructional CD.

4.4 Knowledge of Respondents in Malayalam Language

4.4.1 Skills of respondents on letter identification.

4.4.2 Knowledge of respondents on arrangement of Malayalam alphabet.

4.4.3 Knowledge of respondents on letter recognition.

4.4.4 Skills of respondents on word and picture recognition.

4.4.5 Aptitude of respondents on writing skills.

4.5 Performance of Respondents While Doing Activities from Activity Book.

4.6 Assessment of the Effectiveness of the Activity Book Developed.

4.7 Evaluation of Developed Activity Book by Experts.

#### **4.1 General information of the selected children.**

The table below endows the general information of selected children.

**Table 1**

### General information of the respondents

SL No:	Particulars	Responses (N=10)%
<b>1.</b>	<b>Gender</b>	
	• Male	40
	• Female	60
<b>2.</b>	<b>Age in years</b>	
	• 3	20
	• 4	50
	• 5	10
	• 6	20
<b>3.</b>	<b>Class</b>	
	• Completed LKG (6 years)	20
	• Pre-school	80

The above table shows that from the selected sample 60 percent and 40 percent were females and males respectively. Määttä and Uusiautti (2020), in their study reported - according to studies, girls succeed better at school than boys do. Actually, the phenomenon that girls earn better school grades than boys is observed in many countries (Freudenthaler *et.al.*, 2008). Gender differences in educational attainment are seen at the foundation stage of primary education and continue through to the secondary education examinations taken at the end of compulsory education at age 16 (Määttä and Turunen, 1991).

Out of the total respondents, 20 percent were 3 year old pre-schoolers, 50 percent were 4 year old, 10 percent belonged to 5 year old and 20 percent of 6 year old children. According NEP 2020 (National Education Policy) pre-schoolers belong to the age group of 3-6 years old in education structure 5+3+3+4. In the first structure 5 includes 3 years of Anganwadi/pre-school and classes 1 and 2 (3-8 years). From the table it is clear that 20 percent had completed LKG and the remaining was from 3-5 years old.

## 4.2 Development of Activity Book.

One main tool of the study was the activity book which consisted of corporeal activities for the improvement of procedural memory in pre-schoolers. The activities were for Malayalam alphabet (Swaraksharangal and Vyanjanaksharangal) which consisted of 51 alphabet. The title of the activity book was 'Learn Malayalam Through Art and Craft'. The activities symbolises art and craft and this how the title of the book formed. The book was self designed by the investigator itself.



Plate 6

### Printed Version of Activity Book

The activity book (the work pages, cover page etc) was designed using an app called 'Canva'. For users to understand better each page was designed in a specific manner, that is activity



pages have yellow coloured sheets, procedure sheets are green coloured and worksheets are blue coloured.

The main aim of the activity book was to improve the fine motor skills in pre-schoolers. Some activities included functions like tracing, colouring, sticking, clay modelling etc. Some activities were taken from other sources but a few were designed by the investigator itself.

The activity book is very helpful for parents, teachers and special educators to instil early literacy skills in Malayalam language. The activity book also consisted of one instructional CD which ensured the clear understanding of respondents to do activities. The activity book and the instructional CD encompass all the three styles of learning – visual, auditory and kinesthetic.

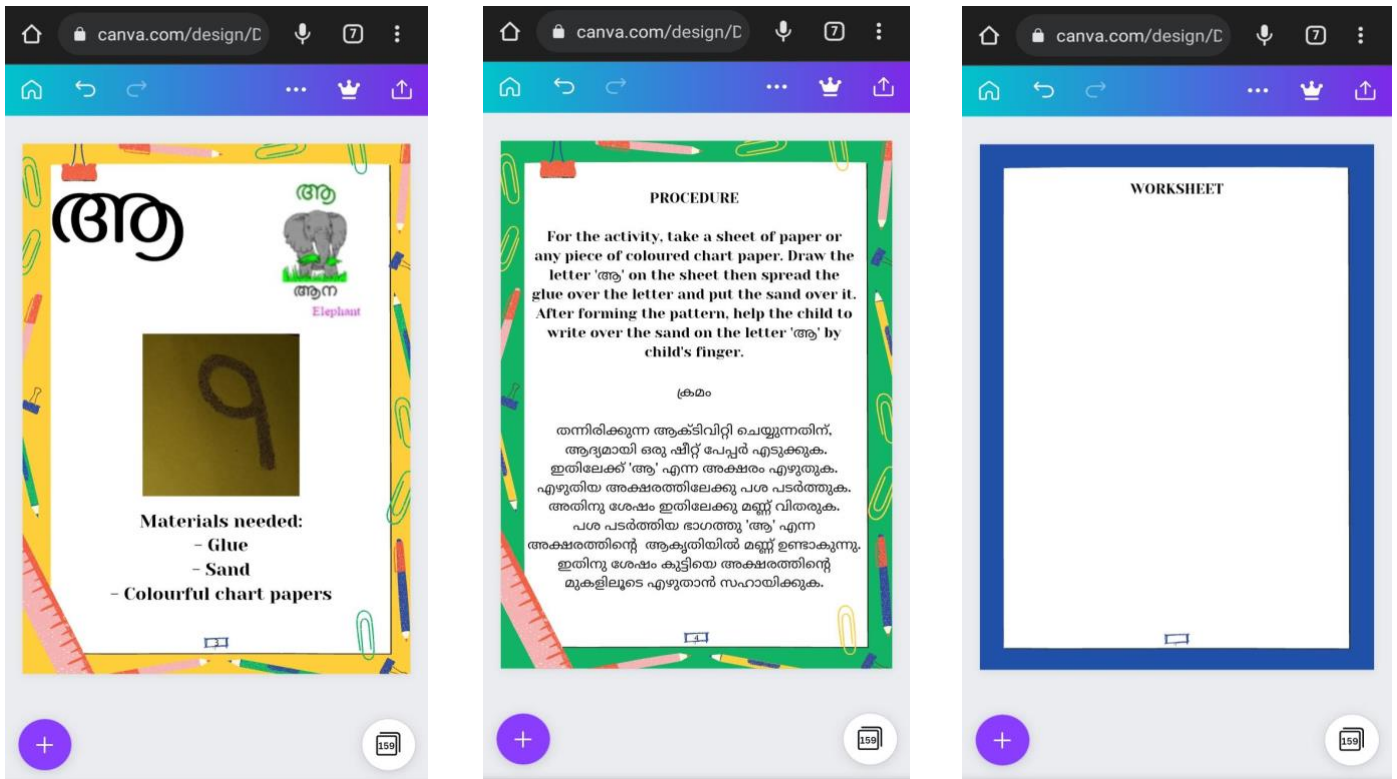
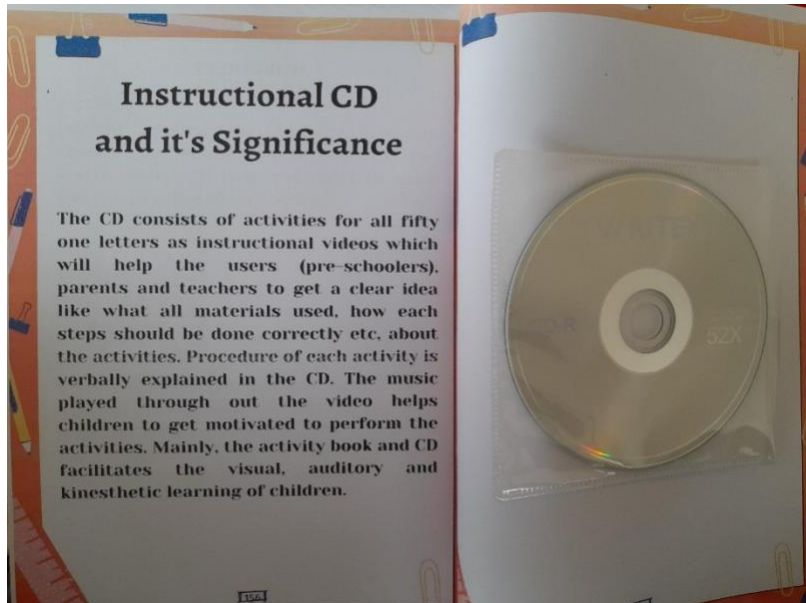


Plate 7

Working on activity book using the app

#### 4.6 Development of Instructional CD.

The instructional CD was another main tool of the study. The CD consisted of the explanation and instructions about the activities which were incorporated in activity book.



**Plate 8**

### **Instructional CD Attached with Activity Book**

The CD included the activities for all the fifty-one letters in Malayalam language. The videos gave a clear idea like what all materials are used for each activity, how each step should be done correctly in activities etc. The music played through out the video helped children to become motivated to perform the activities.

#### **4.4 Knowledge of Respondents in Malayalam Language**

The current understanding of respondents in Malayalam was assumed by a questionnaire which was self designed. The questionnaire consisted of five questions which were further categorised into Letter identification, Arrangement of Malayalam letters, Letter recognition, Word and picture recognition and Writing skills. The questionnaire was a three point scale where 3,2,1

implied Excellent, Very good and Good respectively out of total fifteen marks where each question carried three marks.

#### 4.4.1 Skills of respondents on letter identification.

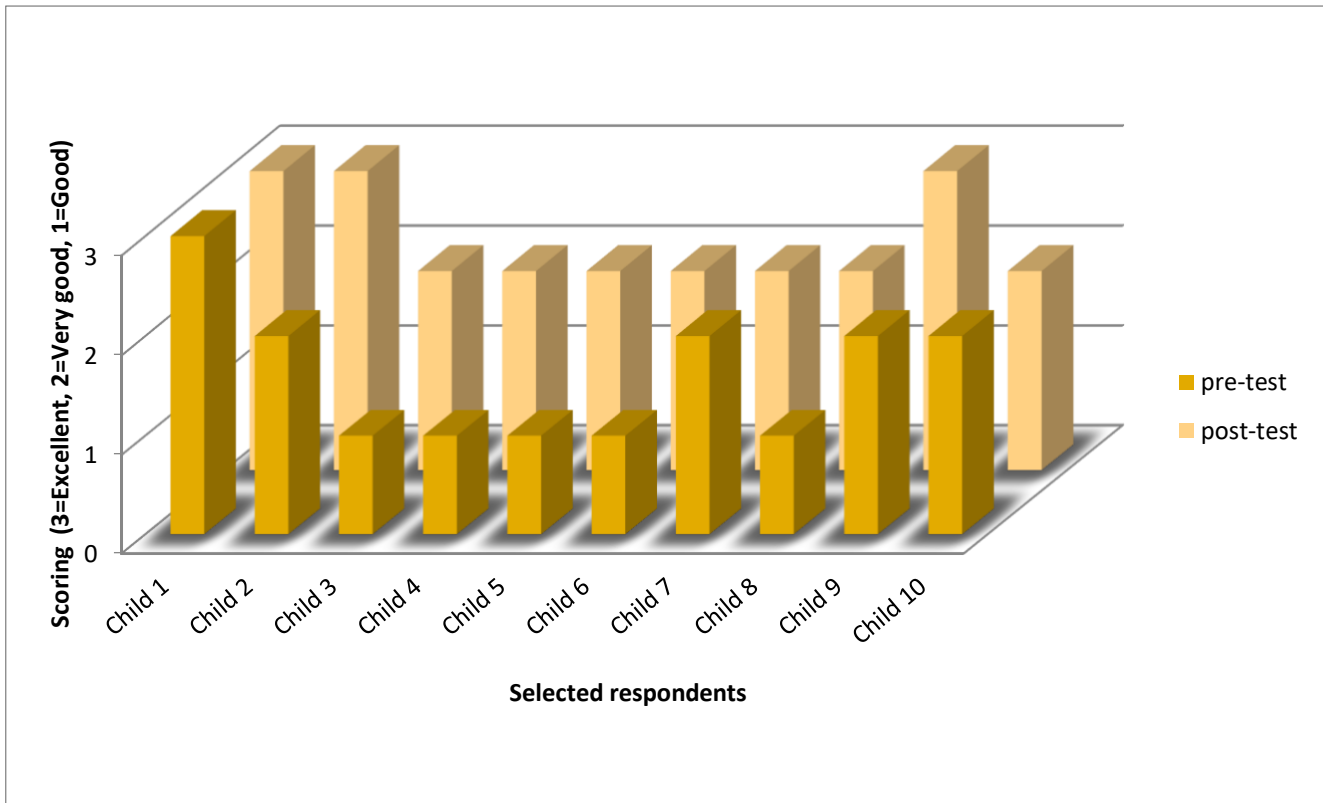
The table given below explains the performance of respondents on letter identification.

**Table 2**

#### **Skills of respondents on letter identification**

Category of question	Respondents (Children)	Pre-test		Post-test	
		Scoring (3=excellent, 2=very good, 1=good)	Percentage (N=10)% (out of 3)	Scoring (3=excellent, 2=very good, 1=good)	Percentage (N=10)% (out of 3)
Skills on letter identification	1	3	100	3	100
	2	2	67	3	100
	3	1	33	2	67
	4	1	33	2	67
	5	1	33	2	67
	6	1	33	2	67
	7	2	67	2	67
	8	1	33	2	67
	9	2	67	3	100
	10	2	67	2	67

Figure 2 indicates the response of respondents on letter identification.



**Fig 2**

### **Skills on letter identification**

For evaluating the knowledge of respondents from the questionnaire they were given a blend of English and Malayalam letters and were asked to identify the Malayalam letters. The above table and graph indicate that, out of 10 respondents only one showed excellent performance in letter identification in pre-test. According to many studies experts have reported that children who have difficulty in letter identification have also showed difficulty in reading and writing. As shown in table 2, in the post-test most of the selected children showed improvement in letter recognition.

Letter identification includes being able to differentiate between distinct letters and their shapes and should be taught before, or at the very least, in conjunction with letter sounds. Upon

entering school, kids come with a range of skills and an even wider range of alphabetic knowledge. For instance, they may have experience with the alphabet by singing the alphabet song. Other kindergarteners can spell their names or identify environmental print. To have true fluency in letter identification, kids must find letters and say their names in and outside of context. It's not the only accuracy but also automaticity, that is, being accurate and fast simultaneously, which leads to later reading success (Lynch, 2020), and for this children should have proper development of their procedural memory.

From the table 2 it is clear that Child 1 showed sustained excellent score for both pre-test and post-test, the child was very intelligent and had great observation. On other side Child 2, 3, 4, 5, 6, 8 and 9 showed an improvement in their performance, where Child 2 and 9 reached the 'excellent' level compared to the pre-test. Other respondents like Child 3, 4, 5, 6 and 8 from 'good' level reached the level 'very good'. But in the performance of Child 7 and 10 they remain unchanged (neither improved nor worsen) and this may be because of their less attention or observation of respondents.

#### **4.4.2 Knowledge of respondents on arrangement of Malayalam alphabet.**

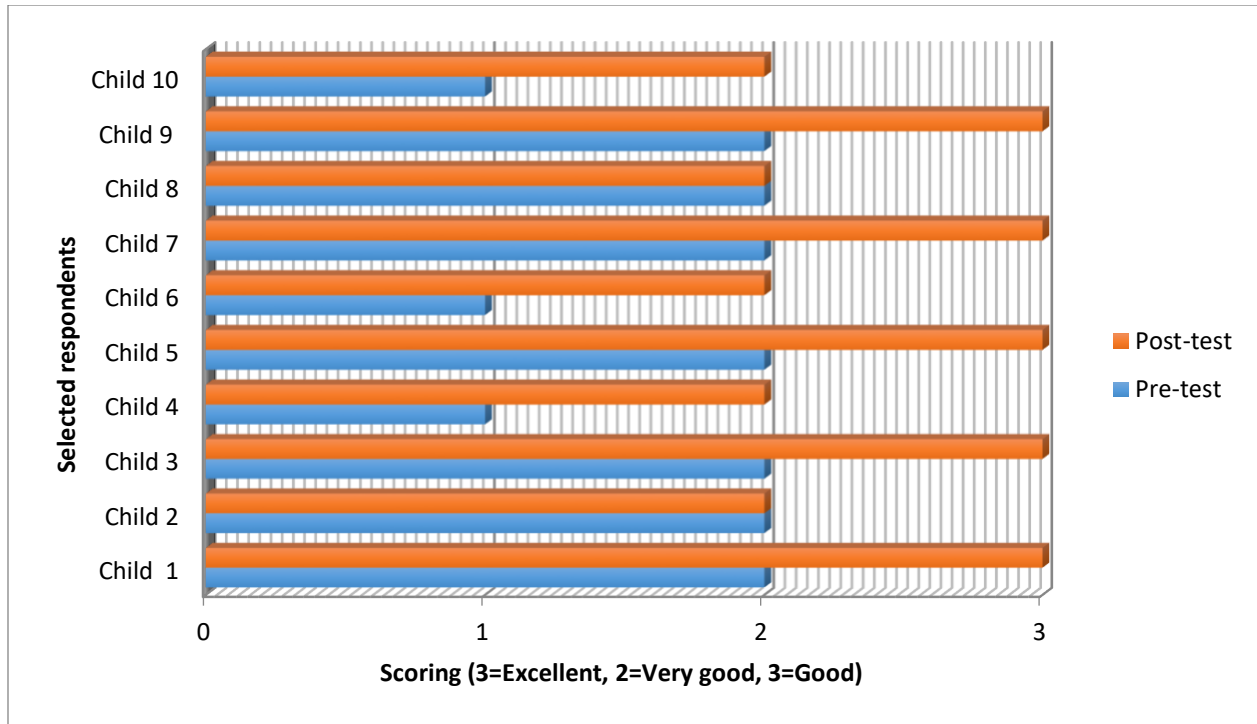
Respondent's knowledge on arrangement of Malayalam alphabet are given in table 3.

**Table 3**

**Knowledge on arrangement of Malayalam alphabet**

Category of question	Respondents (Children)	Pre-test		Post-test	
		Scoring (3=excellent, 2=very good, 1=good)	Percentage (N=10)% (out of 3)	Scoring (3=excellent, 2=very good, 1=good)	Percentage (N=10)% (out of 3)
Knowledge on arrangement of Malayalam alphabet	1	2	67	3	100
	2	2	67	2	67
	3	2	67	3	100
	4	1	33	2	67
	5	2	67	3	100
	6	1	33	2	67
	7	2	67	3	100
	8	2	67	2	67
	9	2	67	3	100
	10	1	33	2	67

Figure 3 indicates the response of respondents on the knowledge about the arrangement of Malayalam alphabet.



**Fig 3**

**Knowledge on arrangement of Malayalam alphabet**

The above table and graph (table 3 and figure 3) exhibits that no one from the selected respondents showed any excellent performance in pre-test. Learning the alphabet in proper order helps one to understand the sounds and recall and learn the alphabet easily. Alphabetical order, that early-ingrained knowledge we take for granted, plays a far greater role in our lives than we usually consider. It dictates everything from the organisation of school registers and street maps to the way we navigate through dictionaries, library shelves and even the spice selection at the local supermarket (Street, 2020).

According to Soniak (2011), the practice of having the letters in an established order makes it easier to teach and to learn. In the pre-test the selected respondents showed confusion in arranging the alphabet in proper order and because of this confusion they also showed difficulty in letter identification. More than half of the selected children were not confident but tried to do their best. But three respondents were very confused and stopped answering and by the investigator’s help, they managed to fill the rest.

In the post-test Child 1, 3, 5, 7 and 9 showed a great improvement in their work, like from a ‘very good’ level to an ‘excellent’ level. Child 4, 6 and 10 also showed an improvement in their performance but even in the pre-test Child 2 and 8 didn’t show any improvement.

#### 4.4.3 Knowledge of respondents on letter recognition.

The performance of respondents on letter recognition is given in table 4.

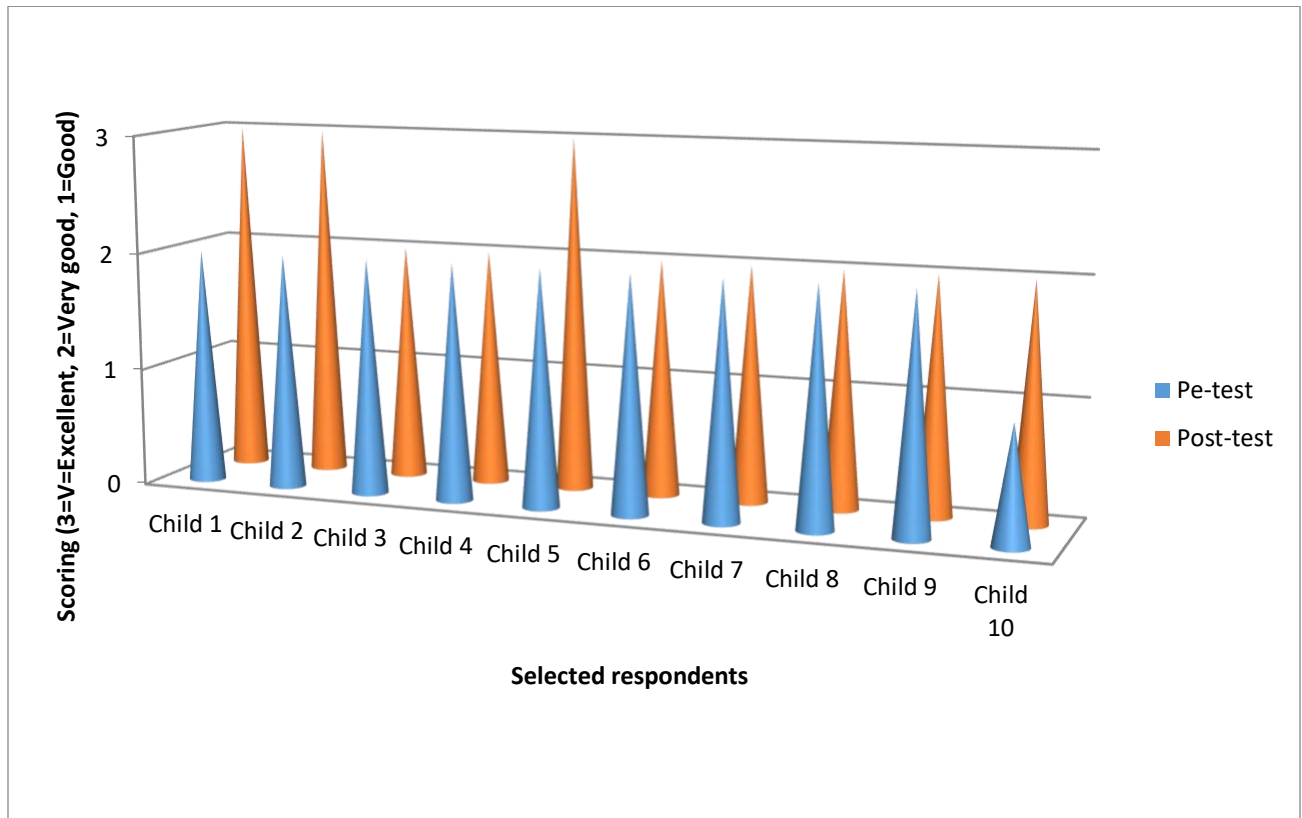
**Table 4**

**Knowledge of respondents on letter recognition**

Category of question	Respondents (Children)	Pre-test		Post-test	
		Scoring (3=excellent, 2=very good, 1=good)	Percentage (N=10)% (out of 3)	Scoring (3=excellent, 2=very good, 1=good)	Percentage (N=10)% (out of 3)
Knowledge on letter recognition	1	2	67	3	100
	2	2	67	3	100
	3	2	67	2	67
	4	2	67	2	67
	5	2	67	3	100
	6	2	67	2	67
	7	2	67	2	67
	8	2	67	2	67
	9	2	67	2	67
	10	1	33	2	67



Figure 3 indicates the response of respondents on the knowledge of respondents on letter recognition.



**Fig 4**

### **Knowledge of respondents on letter recognition**

From the above table (table 4) and figure (fig 4) it is clear that in pre-test even though they didn't show excellent performance, the respondents showed a better work in letter recognition. They were asked to recognize some letters from a blend and circle those with specific colour pens. Child 10 was very confused to recognize the given letters compared to other respondents who showed a 'very good' performance.

According to Lynch (2020), letter recognition is the capacity to call out a letter shown or pick out a letter in a group of letters. Recognition of letters is a foundational part of learning how

to read. Without it, kids struggle to learn letter sounds and recognizing words. Children who cannot identify letters and name them with their sounds have difficulty learning how to read.

Letter recognition is important because it enables beginners to figure out how printed text is associated with the spoken language. Having a mastery of letter names can make learning letter sounds easier for young readers (Punkoney, 2020).

In the post-test Child 1, 2 and 5 showed an ‘excellent’ performance in letter recognition. Child 10 also showed improvement from a ‘good’ level to ‘very good’ level. But other respondents showed a consistent level. This may be because of the complexity of Malayalam language when compared to other languages. These respondents were very confused by the similarities between the Malayalam letters.

#### 4.4.4 Skills of respondents on word and picture recognition.

The table below shows the skills of respondents on word and picture recognition.

**Table 5**  
**Skills on word and picture recognition**

Category of question	Respondents (Children)	Pre-test		Post-test	
		Scoring (3=excellent, 2=very good, 1=good)	Percentage (N=10)% (out of 3)	Scoring (3=excellent, 2=very good, 1=good)	Percentage (N=10)% (out of 3)
Skills on word and picture recognition	1	2	67	3	100
	2	2	67	3	100
	3	1	33	3	100
	4	1	33	2	67
	5	1	33	2	67

	6	2	67	2	67
	7	2	67	2	67
	8	2	67	2	67
	9	2	67	3	100
	10	2	67	2	67

Figure 3 indicates the response of respondents on the word and picture recognition.



**Fig 5**

**Skills on word and picture recognition**

The table and figure (table 5 and fig 5) above depicts the skills of the selected respondents on word and picture recognition. To analyse the skill of respondents they were asked to match some specific pictures with appropriate words. This also showed the respondent’s skill on

observation. Some words like paara (rock), maala (necklace), aana (elephant) etc, were used for this question. From the table it shows that seven respondents exhibited very good performance but not an excellent work in pre-test.

According to Bruner (1964) in a study of Corsini, Jacobus and Leonard (2013), it was suggested that there are three ways by which the human organism extracts meaning from his environmental experience or represents his experience. These three means are: (a) representation on the basis of physical actions (enactive); (b) representation by imagery (ikonic); and (c) representation by symbols (symbolic). While the adult is capable of using all three means of representation, the ability to use all three is not present from birth. Bruner suggests that the preschool child is capable of using both enactive and ikonic means of representation but has only rudimentary ability to use symbolic representation. If this were correct, one consequence might be that the preschool child's capacity for storing information in memory would be better for pictures than for words.

In post-test Child 1, 2, 3 and 9 exhibited an excellent performance. The respondent showed more excitement when they did this question. Similarly Child 4 and 5 also showed improvement. The pictures used made them memorize it more in the post-test. But other respondents – Child 6, 7, 8 and 10 remain unchanged. This may be because of their lack of observation.

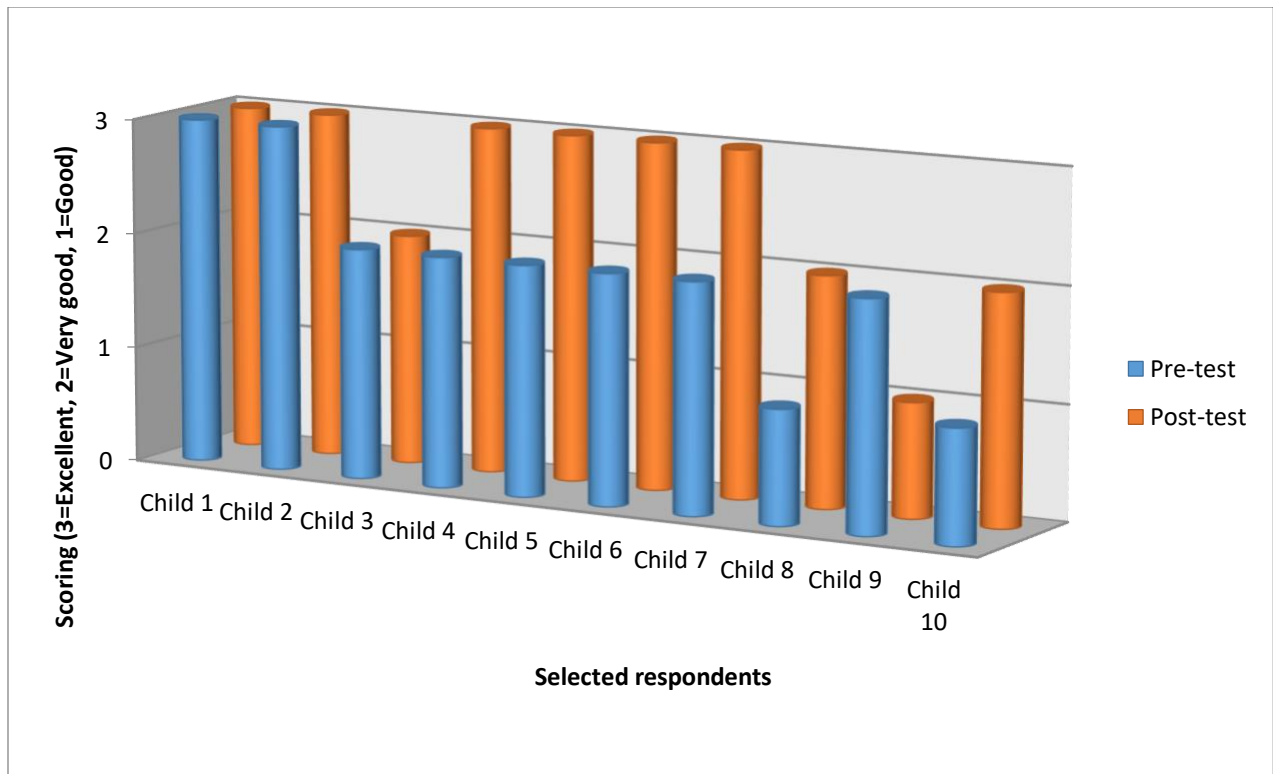
#### **4.4.5 Aptitude of respondents on writing skills.**

Respondent's aptitude on writing skills are given in the table below (Table 6).

**Table 6**  
**Aptitude on writing skills**

Category of question	Respondents (Children)	Pre-test		Post-test	
		Scoring (3=excellent, 2=very good, 1=good)	Percentage (N=10)% (out of 3)	Scoring (3=excellent, 2=very good, 1=good)	Percentage (N=10)% (out of 3)
	1	3	100	3	100
	2	3	100	3	100
	3	2	67	2	67
	4	2	67	3	100
	5	2	67	3	100
	6	2	67	3	100
	7	2	67	3	100
	8	1	33	2	67
	9	2	67	1	33
	10	1	33	2	67

Figure 6 indicates the aptitude of respondents on writing skills.



**Fig 6**

### **Aptitude on writing skills**

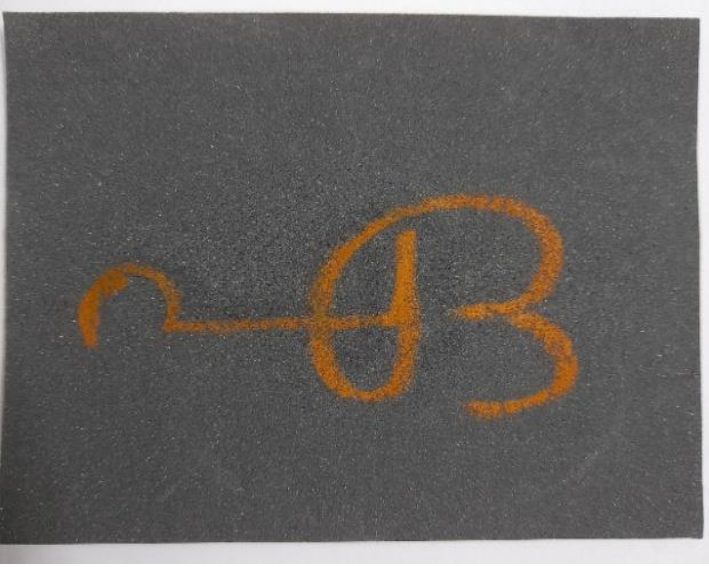
The given table and figure explains the aptitude of the selected respondents on writing skills in pre-test and post test. In pre-test two respondents (Child 1 and 2) showed excellent work but two other respondents (Child 8 and 10) did poorly, compared to other six respondents who did very good performance but not excellent. Respondents were given two letters in dots to evaluate their writing skills.

Pre-writing skills - before teaching children to write, they are the foundational skills that should ideally be imparted to them. These skills determine a child's ability to hold and use a pencil fluidly, write legibly and neatly, and draw and colour with precision. Some important components of pre-writing skills are shapes and strokes that most letters and numbers are made up of such as: Vertical line, Horizontal line, Plus sign, Diagonal line, Triangle, Square, Circle etc. In the post-test as figure 6 shows, more than half of selected respondents (Child 1, 2, 4, 5, 6 and 7) have showed excellent performance. Child 8 and Child 10 have also showed improvement in writing skills and Child 3 showed a sustained performance comparing the pre-test but in contradiction to

that Child 9 showed a fall in the performance compared to the pre-test. This may be because of the poor writing skill (poor tripod grip) that the respondent had practised.

#### **4.5 Observation of Investigator on the Performance of Respondents While Doing Activities from Activity Book.**

To analyze the efficacy of activity book developed, researcher tried some activities in respondents from activity book. The respondents were selected from a school in Thodupuzha in Idukki district. Ten activities were tried from the activity book. The colourful materials for the activities made excitement in respondents. The activities were useful for improving the respondent's eye hand coordination, fine motor skills, writing skills and to improve their procedural memory. With the help of teachers and researcher respondents were very supportive and showed very interest in doing activities. Pencil drawing activities induced more eagerness in respondents.



**Plate 4**  
**Performance of Respondents - 1**



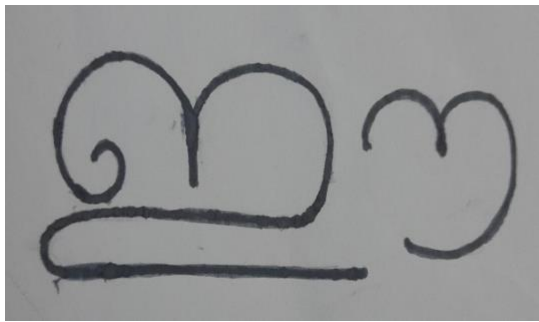
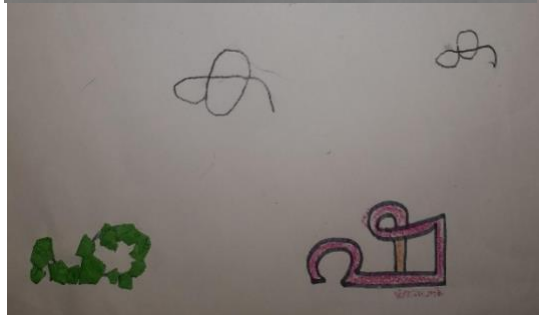
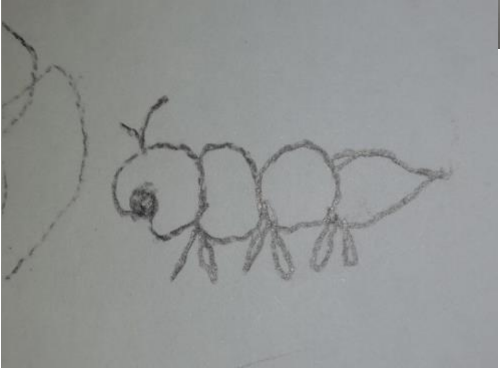
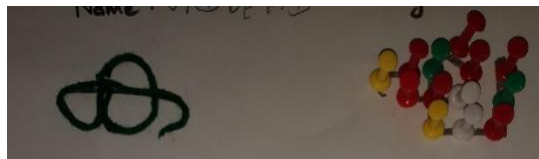


Plate 5

Performance of Respondents - 2



#### 4.6 Assessing the Effectiveness of the Activity Book Developed.

The effectiveness of activity book developed is given below in the table.

**Table 7**  
**Effectiveness of the Activity Book Developed**

SL No:	Particulars	Responses (N=10) (out of 3)	
		Pre-test	Post-test
1.	Skills of respondents on letter identification.	1.6	2.3
2.	Knowledge of respondents on arrangement of Malayalam alphabet.	1.7	2.5
3.	Knowledge of respondents on letter recognition.	1.9	2.3
4.	Skills of respondents on word and picture recognition.	1.7	2.4
5.	Aptitude of respondents on writing skills.	2.0	2.5

From the above table it is clear that the activity book is very effective. The effectiveness is measured by comparing the scores of pre-test and post-test where the test consisted of five questions. The questions was categorised as: Skills of respondents on letter identification, Knowledge of respondents on arrangement of Malayalam alphabet, Knowledge of respondents on letter recognition, Skills of respondents on word and picture recognition, Aptitude of respondents on writing skills and for the sections for pre-test respondents scored 1.6, 1.7, 1.9, 1.7 and 2.0 for post-test they scored 2.3, 2.5, 2.3, 2.4 and 2.5 respectively.

To check the effectiveness of the activity book developed for improving the level of performance in Malayalam language, a paired sample t-test was conducted where the pre-test and post-test is taken into consideration.

A Paired samples t-test was conducted to compare the pre-test and post-test score on the effectiveness of the developed activity book for pre-schoolers. The sample consisted of ten pre-schoolers from De Paul Public School, Thodupuzha between the ages of 3 – 6 years. It took three weeks to complete the data collection (from pre-test, introduction of the activity book to post-test).

**Table 8**

**Comparison of means on the effectiveness of the activity book developed.**

**Paired Samples Statistics**

	Mean	N	Std. Deviation	Std. Error Mean
Pre-test	8.9000	10	1.72884	.54671
Post-test	12.0000	10	1.63299	.51640

First table (table 8) shows the comparison of means on the effectiveness of activity book developed which shows the descriptive statistics of the variables which are mean, standard deviation, standard error mean and the number of observations.

**Table 9**

**Paired Samples Test**

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Pre-test - Post test	-3.10000	.99443	.31447	-3.81137	-2.38863	-9.858	9	.000

The second table (table 9) shows the result of the paired sample t-test. The results indicate a significant difference between the pre-test before introducing the activity book was (M=8.9000; SD=1.72884), and the average post-test score after introducing the activity book was (M=12.0000; SD= 1.63299), [t (9) = -9.858, p = .000]. Here the null hypothesis is rejected.

#### 4.7 Evaluation of Developed Activity Book by Experts.

To understand the efficacy of the activity book and CD, a questionnaire was developed for expert evaluation. Five teachers had evaluated the efficacy of the book and the CD. The questionnaire consisted of eight questions where seven of them were close ended and one was open ended. Three teachers were from the same school as the respondents - that is, De Paul Public, Thodupuzha, and one teacher had the experience of 16 years and the other ma'am was from another school in Thodupuzha itself, Vimala Public School.

The following table show the responses of experts for the activity book and CD.

**Table 11**

**Evaluation of experts for the developed Activity Book**

<b>SL No:</b>	<b>Particulars of questionnaire</b>	<b>Number of experts chosen each option (N=5)</b>
1.	Effectiveness of activity book. (Out of 5)	
	• 5-Excellent	4
	•4 - Very good	1
	•3 - Good	0
	•2 - Fair	0

	•1 - Need more input	0
2.	Comparing and rating the activity book with the basic Malayalam text book (Out of 5).	
	• 5 - Excellent	5
	•4 -Very good	0
	•3 - Good	0
	•2 - Fair	0
	•1- Need more input	0
3.	Children excited to do activities.	
	• Yes	4
	• No	1
4.	Element of activity book which is more effective.	
	• Worksheets	1
	• Activities in activity book	3
	• CD	1
5.	Easy to understand the activities	
	• Yes	5
	• No	0
6.	Easy accessibility of resources for the activities	
	•Yes	5
	•No	0
	• Rarely available	0
7.	Activities were effective in improving the writing skills of children	
	• Yes	5
	• No	0

For the first question about the effectiveness of activity book, 4 teachers commented the activity book was very effective and excellent and 1 teacher and for the second, to evaluate the activity book comparing the current Malayalam text books of children, 5 teachers commented that the activity book was excellent compared to the current text books. This may be because of the

activities incorporated in the activity book but for the Malayalam text books for the current education only explain the letter. Teachers commented that the activities made them more motivated, for example respondents only took ten minutes to have their lunch to do the activities but teachers said that they usually take more than half an hour.

For the third section of questionnaire about the excitement in doing activities, 4 teachers commented that respondents were excited but 1 one teacher commented that the some children were not that interested. This may be because of the gender gap; girls show more excitement than the boys in doing activities. If this happens, make sure to introduce the activities with some breaks in-between.

Three teachers commented that the activities in the activity book were more effective than other elements but one teacher commented CD was more effective and another teacher commented that worksheets were more effective.

Five teachers commented that the instructions in the book were easy to understand and for this CD was more useful. All teachers commented that the materials used in the activities were easy to assess. They also said that the activity book was very effective for improving the writing skills of children.

The 8<sup>th</sup> section was to comment (open ended), the teachers' opinion about the book and for this all five teachers commented that the book was very effective. They also stated that it was easy to understand the instructions and the children enjoyed doing the activities and the book also helped to improve their working skills of children.

## **SUMMARY AND CONCLUSION**

## **CHAPTER - 5**

### **SUMMARY AND CONCLUSION**

The present study titled “Improvement of Procedural Memory in Beginners for Developing early Literacy Skills in Malayalam Alphabet Through Corporeal Activities.” Was conducted in Thodupuzha, Idukki district using ten pre-schoolers in the age range of 3-6 years selected through purposive sampling with the help of self designed questionnaire (pre-test), activity book, instructional CD and is summarized below:

The findings that emerged from the study are as follows:

- From the selected sample 60 percent and 40 percent were females and males respectively.
- Out of the total respondents, 20 percent were 3 year old pre-schoolers, 50 percent were 4 year old, 10 percent belonged to 5 year old and 20 percent of 6 year old children.
- On letter identification Child 2, 3, 4, 5, 6, 8 and 9 showed an improvement in their performance, where Child 2 and 9 reached the ‘excellent’ level compared to the pre-test. Other respondents like Child 3, 4, 5, 6 and 8 from ‘good’ level reached the level ‘very good’. But in the performance of Child 7 and 10 they remain unchanged (neither improved nor worsen).
- On arrangement of Malayalam alphabet, no one from the selected respondents showed any excellent performance in pre-test. But in the post-test Child 1, 3, 5, 7 and 9 showed a great improvement in their work, like from a ‘very good’ level to an ‘excellent’ level. Child 4, 6 and 10 also showed an improvement in their performance but even in the pre-test Child 2 and 8 didn’t show any improvement.
- On letter recognition, in pre-test even though they didn’t show excellent performance, the respondents showed a better work in letter recognition. They were asked to recognize some letters from a blend and circle those with specific colour pens. Child 10 was very confused to recognize the given letters compared to other respondents who showed a ‘very good’ performance.
- In the post-test Child 1, 2 and 5 showed an ‘excellent’ performance in letter recognition. Child 10 also showed improvement from a ‘good’ level to ‘very good’ level. But other



respondents showed a consistent level. This may be because of the complexity of Malayalam language when compared to other languages.

- On word and picture recognition, seven respondents exhibited very good performance but not an excellent work in pre-test.
- In post-test Child 1, 2, 3 and 9 exhibited an excellent performance. The respondent showed more excitement when they did this question. Similarly Child 4 and 5 also showed improvement. The pictures used made them memorize it more in the post-test. But other respondents – Child 6, 7, 8 and 10 remain unchanged.
- On writing skills, in pre-test two respondents (Child 1 and 2) showed excellent work but two other respondents (Child 8 and 10) did poorly, compared to other six respondents who did very good performance but not excellent. Respondents were given two letters in dots to evaluate their writing skills.
- In the post-test as figure 6 shows, more than half of selected respondents (Child 1, 2, 4, 5, 6 and 7) have showed excellent performance. Child 8 and Child 10 have also showed improvement in writing skills and Child 3 showed a sustained performance comparing the pre-test but in contradiction to that Child 9 showed a fall in the performance compared to the pre-test.
- On assessing the effectiveness of the activity book developed, it was observed that for pre-test respondents scored 1.6, 1.7, 1.9, 1.7 and 2.0 for post-test they scored 2.3, 2.5, 2.3, 2.4 and 2.5 respectively.
- For the t-test, the results indicated a significant difference between the pre-test before introducing the activity book was ( $M=8.9000$ ;  $SD=1.72884$ ), and the average post-test score after introducing the activity book was ( $M=12.0000$ ;  $SD= 1.63299$ ), [ $t(9) = -9.858$ ,  $p = .000$ ]. Hence the null hypothesis was rejected.
- For the evaluation by experts for the activity book, For the first question about the effectiveness of activity book, 4 teachers commented the activity book was very effective and excellent and 1 teacher and for the second, to evaluate the activity book comparing the current Malayalam text books of children, 5 teachers commented that the activity book was excellent compared to the current text books.
- About the excitement in doing activities, 4 teachers commented that respondents were excited but 1 one teacher commented that the some children were not that interested.

- Three teachers commented that the activities in the activity book were more effective than other elements but one teacher commented CD was more effective and another teacher commented that worksheets were more effective.
- Five teachers commented that the instructions in the book were easy to understand and for this CD was more useful. All teachers commented that the materials used in the activities were easy to assess.
- For the opinion about the book and for this all five teachers commented that the book was very effective.
- They also stated that it was easy to understand the instructions and the children enjoyed doing the activities and the book also helped to improve their working skills of children.

### **Conclusion**

Results indicate that the activity book and instructional CD were very effective. It may be concluded that the activities (corporeal activities) would be highly beneficial for pre-schoolers.

### **Limitation**

- The sample size was limited.

### **Suggestions**

- This study could be implemented on a large sample.
- Malayalam language has even more alphabet like long and short vowels, and this can be extended to that also.

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# **APPENDICES**



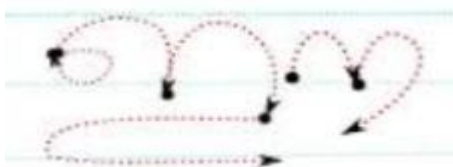
**APPENDIX – I**  
**ACTIVITY BOOK DEVELOPED**

**APPENDIX – II**  
**INSTRUCTIONAL CD**





5) Join the dots and complete the letters



**APPENDIX - IV**  
**FEEDBACK FORM FOR TEACHERS**

**Name :**

**School working for :**

**Place :**

**1) How will you rate the Activity Book for it's effectiveness out of 5 ?**

- A) 5 – excellent**
- B) 4 – very good**
- C) 3 – good**
- D) 2 – fair**
- E) 1 – needs more input**

**2) Compared to the basic Malayalam text books used in the school for primary section, how will you rate the workbook out of 5?**

- A) 5 – excellent**
- B) 4 – very good**
- C) 3 – good**
- D) 2 – fair**
- E) 1 – needs more input**

**3) Were the children excited to do the activities explained in the Activity Book?**

- A) Yes**
- B) No**

**4) In the following options which one do you think that really helped the children in improving their Malayalam letter formation?**

- A) Worksheets provided**
- B) Activities incorporated in the book**
- C) Instructional CD**

**5) Was it easy to understand the information (procedure for each activity) in the book?**

- A) Yes**
- B) No**

**6) What do you think about the resources for the activities, is it easy for the children to collect things for the activities?**

**A) Yes**

**B) No**

**C) Rarely available**

**7) Do you think the activities on the Activity Book will improve the children's writing skill?**

**A) Yes**

**B) No**

**8)How far this book is effective? Note your observations and opinions:**