INNOVATIVE APPROACHES IN TEACHING EARLY BRAILLE READING SKILLS: A THEORY AND PRACTICE STUDY

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Article Info	ABSTRACT
	This study examines innovative approaches in teaching early braille reading skills for children with visual disabilities, in line with Sustainable Development Goal (SDG) 4, which emphasizes inclusive and quality education. Current issues show gaps in the implementation of consistent braille education, especially in developing countries, as well as a lack of training and support for special education teachers. This study aims to understand related theories, analyze methods of teaching early braille reading skills, and develop a conceptual framework for the application of creativity skills in braille teaching. The research methodology uses a comprehensive literature review approach, analyzing learning theories, early reading skills teaching methods, and braille code teaching methods. The main findings show the importance of a flexible and adapted approach in teaching, with the integration of various theories and methods to meet the individual needs of children. This study contributes to a deeper understanding of the teaching of early braille reading skills and supports the development of special education theory. Practical implications include the need for more comprehensive teacher training, the use of more flexible teaching approaches, and the integration of technology in the teaching of braille. In terms of social implications, this study supports the development of a more inclusive society by increasing educational opportunities for children with visual disabilities. This study suggests further research, including longitudinal studies to evaluate the long-term effectiveness of various teaching methods, as well as research on technology integration in braille teaching. In conclusion, this study provides a solid foundation to improve the quality of teaching early braille reading skills, further supporting the achievement of SDG 4 and sustainable development as a whole.

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INTRODUCTION

Teaching early braille reading skills for children with visual disabilities plays an important role in forming the basis of inclusive and effective education in the 21st century education era. Braille, as a tactile writing system, has become the main tool to ensure that individuals with vision problems can achieve literacy equivalent to their peers with normal vision (Hilditch, 2023). Teaching braille not only helps in literacy but also in building the confidence and self-reliance of these individuals.

However, there are a number of current issues that arise in the context of special education, including challenges in providing adequate resources and effective teaching methods for teaching braille. At the global level, there is a gap in the implementation of consistent braille education, especially in developing countries that may lack funds and expertise (World Blind Union, 2024). For example, in many Asian countries, the application of braille education is not yet comprehensive and often depends on individual initiatives or non-governmental organisations (World Blind Union, 2024). In Malaysia, despite efforts to increase awareness and the importance of braille in special education, there is still an urgent need to improve braille teaching and learning approaches.

To address these issues, several key problems need to be addressed in teaching early braille reading skills. Among them is the lack of training and support for special education teachers who teach braille, as well as the lack of appropriate and up-to-date teaching materials (American Foundation for the Blind, 2024). The objective of the study in this field is to understand related theories and methods of teaching early braille reading skills for children with visual disabilities. Through this study, the researcher hopes to develop an effective conceptual framework for the application of creativity skills in braille teaching and learning.

Research findings in this field are expected to make a significant contribution to understanding and improving existing braille teaching methods. In addition, these studies will also contribute to the development of special education theory by improving our understanding of how creativity can be integrated in teaching to improve learning effectiveness. Recommendations from these studies include the need to increase training and support for braille teachers as well as the provision of more innovative and effective teaching resources and materials.

Teaching early braille reading skills also aligns with Sustainable Development Goal (SDG) 4, which aims to ensure inclusive and equitable quality education and promote lifelong learning opportunities for all (United Nations, 2018). Through increased braille teaching, we can ensure that children with visual disabilities have access to quality and inclusive education, helping them reach their full potential.

In conclusion, teaching early braille reading skills in the era of 21st century education is important to form the basis of an inclusive and effective education. Through the improvement of teaching methods and the provision of sufficient resources, we can ensure that children with visual disabilities have access to quality and inclusive education, in line with SDG 4. In addition, with the use of the dual learning method that combines Rumi writing and braille writing, teachers and parents can help students learn reading and writing in a more effective and enjoyable way.

This article is structured with an introduction to the concept and importance of braille teaching, followed by a discussion of current issues and research gaps. Next, it will discuss the theory and methods of teaching early braille reading skills using a literature review before touching on the findings and contributions expected from this study. Finally, this article will provide recommendations for future research and practice in the area of teaching early braille reading skills. This article provides a comprehensive structure to discuss current issues, theories, and methods of teaching early braille reading skills, findings, and recommendations related to teaching early braille reading skills.

THEORY OF TEACHING EARLY BRAILLE READING SKILLS

Special education for children with visual disabilities requires a different approach than mainstream education. One of the important aspects of this education is the teaching of early braille reading skills. Braille is a writing system that allows blind and visually impaired people to read by touch. Here are some theories that can be used in teaching early braille reading skills, with further explanations.

Piaget's Theory of Cognitive Development

Jean Piaget, a famous educational psychologist, developed a theory of cognitive development that divided children's development into four main stages: sensorimotor, preoperational, concrete, and formal (Piaget, 1952). This theory provides a deep understanding of how children learn and develop cognitively, and it is very useful in teaching early braille reading skills.

Sensorimotor Stage (0-2 years)
The sensorimotor stage is the phase where children learn through touch and movement. They use their senses to explore the world around them. When teaching braille, teachers can introduce children at this stage to the texture and shape of braille letters through activities that involve touch and movement. For example, teachers can use a braille board that has large letters that are simple to touch. Teachers can provide children with the opportunity to touch and feel the braille letters with their hands. This activity helps children develop an initial understanding of the shape and texture of braille letters. In addition, teachers can use everyday objects that are associated with braille letters. For example, teachers can use a ball to represent the letter 'b' and ask children to touch the ball and the letter 'b' alternately. This helps children associate objects with braille letters.

PreOperation Stage (2–7 years)
The preoperational stage is the phase in which children begin to understand early concepts such as symbols and representations. They also began to use symbols to represent objects or ideas. At this stage, educators can instruct children to identify braille letters and link them to specific sounds or objects. Teachers can use activities that involve everyday objects and relate them to braille letters to help children understand the concept of reading. For example, teachers can use braille textbooks that have pictures of objects and related braille letters. Teachers can give children the opportunity to touch the braille letters and associate them with pictures of objects. In addition, teachers can use interactive games that use braille letters. For example, the teacher can ask the children to find certain braille letters in the textbook and touch them. This helps children master braille reading skills more quickly and effectively.

Concrete Stage (7-11 years)
The concrete stage is the phase where children begin to think logically and use concrete concepts to understand the world around them. Teachers can teach children to read braille words and sentences more effectively at this stage. Teachers can use activities that involve braille words and sentences to help children understand reading concepts. For example, a teacher could use a braille textbook with a short story and ask the children to read it. Teachers can give children the opportunity to touch the braille letters and read words and sentences in turn. In addition, teachers can use interactive games that use braille words and sentences. For example, the teacher can ask the children to find certain words in the story and touch them. This helps children master braille reading skills more quickly and effectively.

Formal Level (11 years and above)
The formal stage is the phase where children begin to think abstractly and use abstract concepts to understand the world around them. Teachers can teach children to read and understand more complex braille texts at this stage. Teachers can use activities that involve more complex braille text to help children understand reading concepts. Teachers, for example, can use braille textbooks with longer articles or stories and ask children to read them. Teachers can give children the opportunity to touch the braille letters and read words and sentences in turn. In addition, teachers can use interactive games that involve more complex braille text. For example, teachers can ask children to find certain words in an article or story and touch them. This helps children master

braille reading skills more quickly and effectively. Figure 1 shows the four main stages of Piaget's (1952) theory of cognitive development.

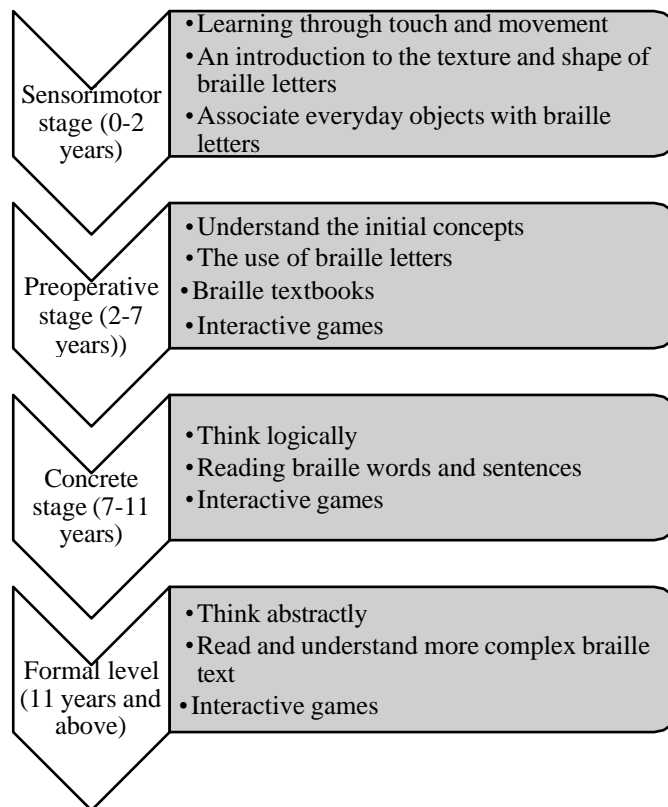| Sensorimotor stage (0-2 years) | • Learning through touch and movement
• An introduction to the texture and shape of braille letters
• Associate everyday objects with braille letters |
Preoperative stage (2-7 years))	• Understand the initial concepts • The use of braille letters • Braille textbooks • Interactive games
Concrete stage (7-11 years)	• Think logically • Reading braille words and sentences • Interactive games
Formal level (11 years and above)	• Think abstractly • Read and understand more complex braille text • Interactive games

Figure 1. The four main stages of Piaget's theory of cognitive development (1952)

In conclusion, Piaget's theory of cognitive development provides a deep understanding of how children learn and develop cognitively. In teaching early braille reading skills, this theory is very useful because it helps teachers understand children's developmental stages and adjust their teaching according to those stages. By using activities that suit the child's developmental stage, teachers can provide a holistic and effective learning experience for their children. Piaget's theory helps teachers plan lessons that are more structured and orientated towards children's cognitive development, ensuring that they get an education that suits their abilities and needs.

Piaget's Cognitive Learning Theory (1970)

In 1970, Jean Piaget developed a theory of cognitive development that divided children's development into four main stages: sensorimotor, preoperational, concrete, and formal. This theory provides a deep understanding of how children learn and develop cognitively, and it is very useful in teaching early braille reading skills. We will explain the five main concepts in Piaget's theory: schemata, adaptation, assimilation, accommodation, and balance, and explore their application in teaching braille (Piaget, 1970). Figure 2 shows the five main concepts of Piaget's (1970) cognitive learning theory.
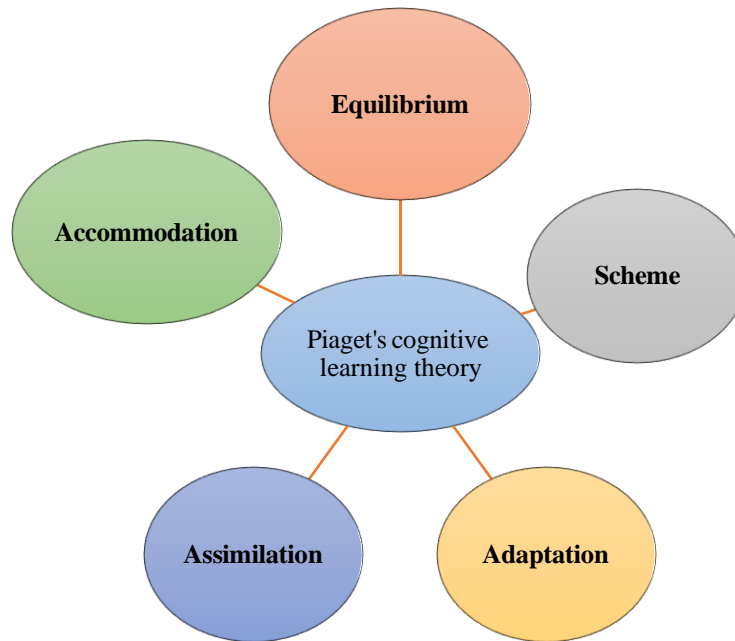
Figure 2. The five main concepts of Piaget's cognitive learning theory (1970)

Scheme

Schemas refer to cognitive structures or thought patterns that children use to understand and interpret the world around them. In the context of braille instruction, schema can refer to a child's understanding of braille letters, words, and sentence structure. Teachers need to help children develop a strong and accurate schema about braille by providing structured and repetitive learning experiences. For example, teachers can use braille boards that have large and easy-to-touch letters, as well as everyday objects that can be associated with braille letters.

Adaptation

Adaptation refers to the process by which children adjust their schemas to adapt to a new environment or new information. In braille instruction, adaptation can occur when children learn new braille letters or read more complex words and sentences. Teachers need to help children adapt their schemas by providing appropriate help and support. For example, teachers can use the 'scaffolding' method, in which they provide less and less help until the child can do the task independently.

Assimilation

Assimilation refers to the process by which children use existing schemas to interpret new information. In braille teaching, assimilation can occur when children use their knowledge of braille letters to read new words and sentences. Teachers need to help children assimilate new information by providing structured and repetitive learning experiences. For example, a teacher could use a braille textbook with a short story and ask the children to read it. You can give the children the opportunity to touch the braille letters and read words and sentences in turn.

Accommodation

Accommodation refers to the process by which children change their schema to accommodate new information that does not fit their existing schema. In braille teaching, accommodation can occur when children learn new braille letters or read more complex words and sentences. Teachers need to help children accommodate their schemas by providing appropriate help and support. For example, teachers can use interactive games that use

new braille letters. For example, the teacher can ask the children to find certain braille letters in the textbook and touch them.

Equilibrium

The state in which children achieve stability between their schemas and new information is referred to as equilibrium. When children master braille reading skills and can use them effectively, they achieve balance in braille teaching. Teachers need to help children achieve balance by providing structured and repetitive learning experiences. Teachers, for example, can use braille textbooks with longer articles or stories and ask children to read them. Teachers can give children the opportunity to touch the braille letters and read words and sentences in turn.

In conclusion, Piaget's theory of cognitive development provides a deep understanding of how children learn and develop cognitively. This theory is extremely useful in teaching early braille reading skills because it helps teachers understand children's developmental stages and adjust their teaching accordingly. By using concepts such as schema, adaptation, assimilation, accommodation, and balance, teachers can provide a holistic and effective learning experience for their children.

Theory of Behaviorism

Behaviorist theory, developed by experts such as Pavlov, Skinner, and Watson, emphasizes the use of Reinforcement and repetition in the learning process. This theory assumes that human behavior can be learned through the process of conditioning, where certain behaviors can be strengthened or weakened through the use of rewards and punishments. In the context of teaching early braille reading skills, behaviorist theory can be used to strengthen learning and help children master braille reading skills more quickly and effectively. Figure 3 shows the main concepts in behaviorist theory.
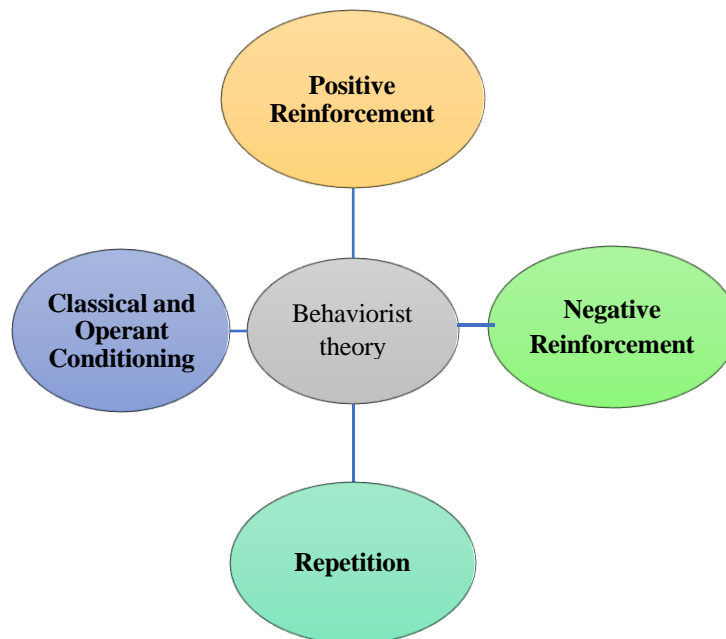

Figure 3. The main concept of behaviorist theory

Positive Reinforcement

Positive reinforcement refers to giving rewards or praise to children when they successfully complete a task. In teaching braille, teachers can use strategies such as positive reinforcement to reinforce learning. For example,

teachers can praise children when they read braille correctly. This praise can be in the form of words of praise, stickers, or other small rewards that can motivate children to continue learning and trying.

Negative Reinforcement

Negative reinforcement refers to the reduction or elimination of something undesirable in order to reinforce a desired behavior. In teaching braille, negative reinforcement can be used in a way that does not harm the child. For example, teachers can reduce the number of assignments given to children when they successfully read braille correctly. This can motivate children to keep learning and trying because they know that the number of assignments will decrease if they succeed.

Repetition

Repetition refers to the repeated use of activities to reinforce learning. In teaching braille, repetition can be used to help children master braille reading skills. For example, teachers can prepare activities that involve repeating braille letters and ask children to read the letters over and over. This repetition can help children master braille reading skills more quickly and effectively.

Classical and Operant Conditioning

Classical conditioning, developed by Ivan Pavlov, involves the use of an unrelated stimulus to elicit a desired response. In teaching braille, classical conditioning can be used in a way that does not harm children. For example, a teacher can use certain sounds or gestures to elicit a desired response from a child, such as reading braille correctly.

Operant conditioning, developed by Skinner, involves the use of rewards and punishments to reinforce or reduce certain behaviors. In teaching braille, operant conditioning can be used to reinforce learning. For example, teachers can reward children when they read braille correctly and give small punishments, such as reducing the amount of work, when they don't.

In conclusion, behaviourist theory provides a deep understanding of how human behaviour can be learnt through the conditioning process. In teaching early braille reading skills, this theory is very useful because it helps teachers reinforce learning and motivate children to continue learning and trying. By using strategies such as positive reinforcement, negative reinforcement, repetition, and classical and operant conditioning, teachers can provide a holistic and effective learning experience for their children.

Theory of Constructivism

The theory of constructivism, developed by experts such as Jean Piaget, Lev Vygotsky, and Jerome Bruner, emphasizes that learning is an active process in which individuals construct their own knowledge through interaction with their environment and experiences. In the context of teaching early braille reading skills, constructivist theory can be used to help children build their own understanding and skills in reading braille. Figure 4 shows the main concepts in constructivism theory.
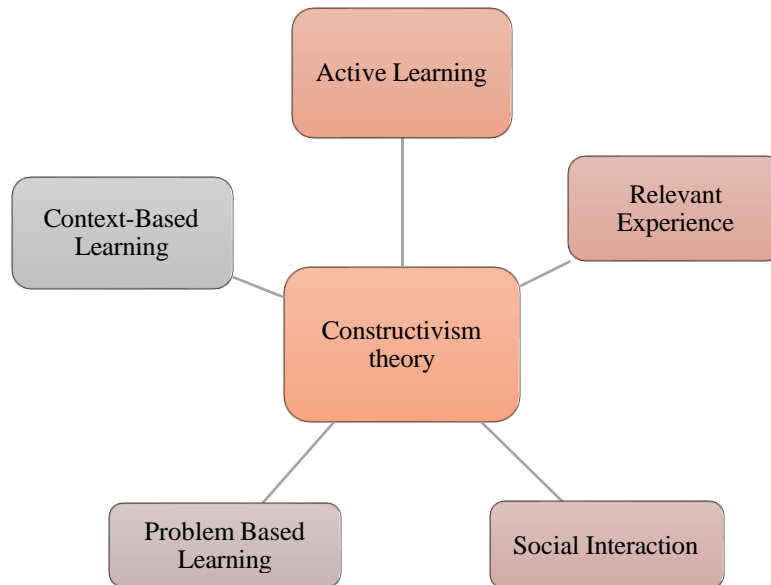
Figure 4. The main concept of constructivism theory

Active Learning
Active learning refers to the process by which children construct their own knowledge through interaction and experience. In braille teaching, teachers need to create a learning environment that encourages children to be actively involved in the learning process. For example, teachers can use braille letters in practical activities. Teachers can provide children with the opportunity to touch and feel the braille letters, and encourage them to independently read braille words and sentences.

Relevant Experience
Related experience refers to the use of previous experience to build new knowledge. In braille teaching, teachers need to connect braille learning with children's previous experiences. Teachers, for example, can use everyday objects that children already know and associate with braille letters. For example, the teacher can use a ball to represent the letter 'B' and ask the children to touch the ball and the letter 'B' alternately. This helps children associate objects with braille letters and build a deeper understanding.

Social Interaction
Social interaction refers to the process by which children learn through interaction with others. Teachers need to create a learning environment that encourages social interaction when teaching braille. Teachers, for example, can use braille letters in group activities. Teachers can provide children with the chance to collaborate in small groups to read braille words and sentences. This social interaction helps children build their own understanding and skills in reading braille.

Problem-Based Learning
Problem-based learning refers to an approach in which children learn by solving problems. Teachers must create activities that require children to solve problems when teaching braille. For example, teachers can assign tasks that require children to find specific braille letters in a textbook and touch them. This task requires children to use their knowledge of braille letters to solve problems and build deeper understanding.

Context-Based Learning
Context-based learning refers to an approach where children learn in a meaningful context. Teachers must create activities that are meaningful and related to children's daily lives in braille teaching. Teachers, for example, can

use stories about children's daily lives and ask them to read them in braille. These activities help children relate braille learning to their daily lives and build a deeper understanding.

In conclusion, constructivism theory provides a deep understanding of how children learn and develop cognitively. This theory is extremely useful in teaching early braille reading skills because it helps teachers build a learning environment that encourages children to be actively involved, use previous experiences, interact socially, solve problems, and learn in a meaningful context. By using a constructivist approach, teachers can provide a holistic and effective learning experience for their children.

Nativism theory

Nativism theory emphasises that some skills and knowledge are innate or genetic rather than acquired through experience or learning. This theory was developed by experts such as Noam Chomsky, who proposed that humans are born with a certain mental structure that allows them to learn language quickly and efficiently. In the context of teaching early braille reading skills, the theory of nativism can be used to understand how children with visual disabilities learn and master braille more quickly if they have a predisposition or mental structure that allows them to do so. Figure 5 shows the main concept of nativism theory.
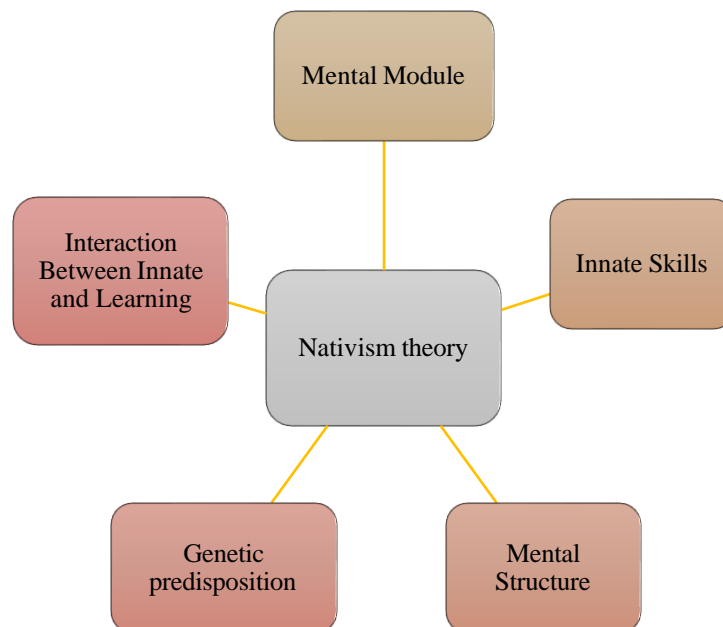
Figure 5. The main concept of nativism theory

Mental Module
Mental modules refer to cognitive structures that are innate and specific for a specific purpose. In teaching braille, teachers need to understand that children may have mental modules that allow them to learn braille more quickly and efficiently. For example, children may have a tendency to understand and remember certain patterns, which can help them learn braille letters more easily. Teachers can use activities that capitalise on this tendency, such as asking children to look for certain patterns in braille text.

Innate Skills
Innate skills refer to skills that are naturally present and do not need to be learnt through experience. In braille teaching, teachers need to identify children's innate skills and use them to speed up the learning process. For example, children may have an innate ability to recognise textures and shapes, which can help them learn braille

letters more quickly. Teachers can use activities that involve the use of textures and shapes to strengthen these innate skills.

Mental Structure

Mental structure refers to the innate cognitive organisation that allows humans to process information quickly and efficiently. In teaching braille, teachers need to understand that children may have mental structures that allow them to process braille information more quickly. For example, children may have a mental structure that allows them to recognise and remember the patterns of braille letters more easily. Teachers can use activities that tap into this mental structure, such as asking children to find patterns of braille letters in a text.

Genetic predisposition

Genetic predisposition refers to a tendency determined by genes rather than experience. In teaching braille, teachers need to understand that children may have a genetic predisposition that allows them to learn braille more quickly. For example, children may have a genetic predisposition to recognise and remember certain patterns, which can help them learn braille letters more easily. Teachers can use activities that take advantage of these genetic predispositions, such as asking children to look for certain patterns in braille text.

Interaction Between Innate and Learning

The theory of nativism also recognises that the interaction between innate skills and learning is important for cognitive development. In teaching braille, teachers need to create a learning environment that takes advantage of children's innate skills while providing a structured and repetitive learning experience. For example, teachers can use activities that involve the use of textures and shapes to reinforce children's innate skills while providing a structured and repetitive learning experience.

Overall, the theory of nativism provides a deep understanding of how some skills and knowledge are innate or genetic. In teaching early braille reading skills, this theory is very useful because it helps teachers understand children's tendencies and mental structures that allow them to learn braille more quickly and efficiently. By using a nativist approach, teachers can provide a holistic and effective learning experience for their children.

Albert Bandura's Social Learning Theory

Social Learning Theory, presented by Albert Bandura (1977), emphasises that learning does not only happen through direct experience but also through observation and social interaction. This makes this theory very relevant in teaching early braille reading skills, especially for children with visual disabilities who need a more creative and inclusive teaching approach.

Observation (Observational Learning) and Modelling (Modelling):

In the context of braille teaching, children can learn by watching demonstrations by teachers or more proficient peers. For example, a teacher can show the correct way to read braille letters, including how to use the fingers correctly to trace the braille dots. Children can then imitate these movements and practice the technique directly. This process is known as modelling, where children imitate the behaviour they see. Modelling is not only important for learning technical skills but also for understanding the rhythm, speed, and pressure required to read braille effectively.

Vicarious Reinforcement:

Bandura also introduced the concept of indirect reinforcement, where individuals learn about the consequences of behaviour through observing others. In braille instruction, a child may see a classmate receive praise or a reward after successfully reading a paragraph in braille. Seeing their classmates receive this positive acknowledgement can motivate other children to work harder at learning braille in the hope that they too will receive the same reinforcement. This increases children's intrinsic motivation to learn, even though they may have difficulties at first.

Cognitive role and self-efficacy:

Social Learning Theory also emphasises the importance of cognitive processes in learning. This includes the ability to pay attention, process information, and motivate oneself. Teachers can help improve children's self-

efficacy, that is, their confidence in their ability to master braille. By assigning tasks appropriate to the child's ability level and providing continuous positive feedback, teachers can help build children's self-confidence. High self-efficacy is important because it can influence the extent to which the child will strive and persevere in the face of challenges. Children who are confident that they can master braille tend to be more diligent and motivated in the learning process. Figure 6 shows the factors in Albert Bandura's social learning theory (1977).
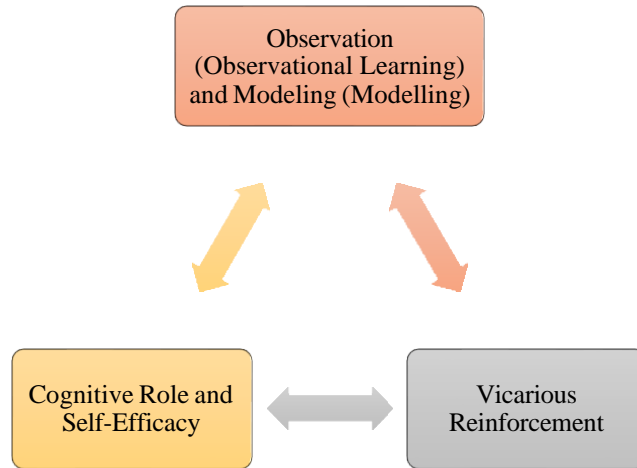

Figure 6. Factors in Albert Bandura's social learning theory (1977).

By incorporating the principles of social learning theory in teaching early braille reading skills, teachers can create a more dynamic and supportive learning environment. This not only facilitates the technical learning of braille but also supports the child's emotional and motivational development, making the learning process more effective and comprehensive.

Vygotsky's Sociocultural Theory (1978)

Vygotsky's sociocultural theory (1978), which is also known as sociocognitive development theory. This theory is one of the most influential educational theories in the field of special education, especially in the context of teaching and learning for children with visual disabilities. Lev Vygotsky, a psychologist, developed this theory in the early 20th century. This theory emphasises the role of social interaction and cultural context in the process of cognitive development. Figure 7 shows the main concepts in Vygotsky's sociocultural theory (1978).
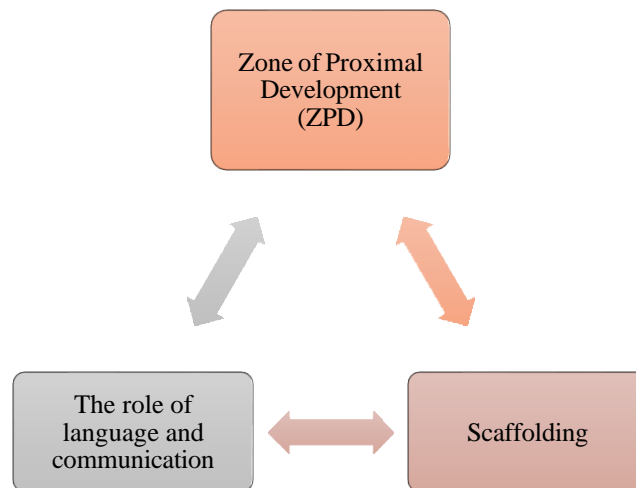
Figure 7. The main concepts of Vygotsky's sociocultural theory (1978)

Zone of Proximal Development (ZPD)
Vygotsky's sociocultural theory introduces several key concepts that help in understanding how learning occurs. One of the most important concepts is the Zone of Proximal Development (ZPD). ZPD refers to the distance between what a child can do on their own and what they can do with help or guidance from someone more experienced, such as a teacher or peer. In the context of special education, ZPD helps teachers assess children's ability levels and provide appropriate assistance to help them achieve higher levels. Vygotsky explained that the ZPD is the distance between the actual level of development achieved by the child independently and the level of potential development achieved with the help of the educator' (Vygotsky, 1978). In conclusion, Zone of Proximal Development (ZPD) is an important concept in Vygotsky's theory that describes the distance between children's current abilities and their potential with help. In special education, ZPD helps teachers effectively assess and support the development of children with visual disabilities.

Scaffolding
Another important concept in Vygotsky's theory is 'scaffolding' or 'temporary construction.' Scaffolding refers to the process in which teachers or educators provide gradual and gradually decreasing assistance so that children can do tasks independently. In special education, scaffolding can involve the use of assistive devices such as braille equipment, screen reader software, or adapted teaching strategies to help children with visual disabilities. Scaffolding helps children to master new skills with progressively reduced assistance (Wertsch, 1985). In conclusion, scaffolding, or gradual assistance, is a teaching method where support is gradually reduced to help children achieve independence. In special education, scaffolding involves the use of aids and teaching strategies adapted to meet the needs of children with visual disabilities.

The role of language and communication
Vygotsky's theory also emphasises the role of language and communication in cognitive development. Language is not only a tool to communicate but also a tool to form and organise thoughts. In the context of special education, this means that teaching and learning need to be adapted to ensure that children with visual disabilities have access to quality and easily accessible learning materials and have the opportunity to interact and communicate with teachers and peers. Vygotsky states that 'language is the primary tool of cognitive and social development' (Rogoff, 1990). In conclusion, Vygotsky's theory emphasises the importance of language and communication in cognitive development. In the context of special education, this means providing access to quality learning materials and opportunities to interact for children with visual disabilities, helping them form and organise their thinking.

Overall, Vygotsky's sociocultural theory provides an important framework for special education, particularly for children with visual disabilities. The concept of the Zone of Proximal Development (ZPD) helps teachers identify the level of ability and potential of children, while scaffolding provides methods to effectively support their learning. Vygotsky's emphasis on the role of language and communication emphasises the importance of access

to appropriate learning materials and opportunities to interact. The application of this theory in special education can increase the effectiveness of teaching and learning, helping children with visual disabilities to reach their full potential in cognitive and social development.

EARLY READING SKILLS TEACHING METHODS

Early reading skills are an important foundation in children's education. It not only helps them understand the text but also fosters interest and love for learning. Here are some methods of teaching early reading skills that can be used to help children learn to read more effectively. Figure 8 shows the method of teaching early reading skills.
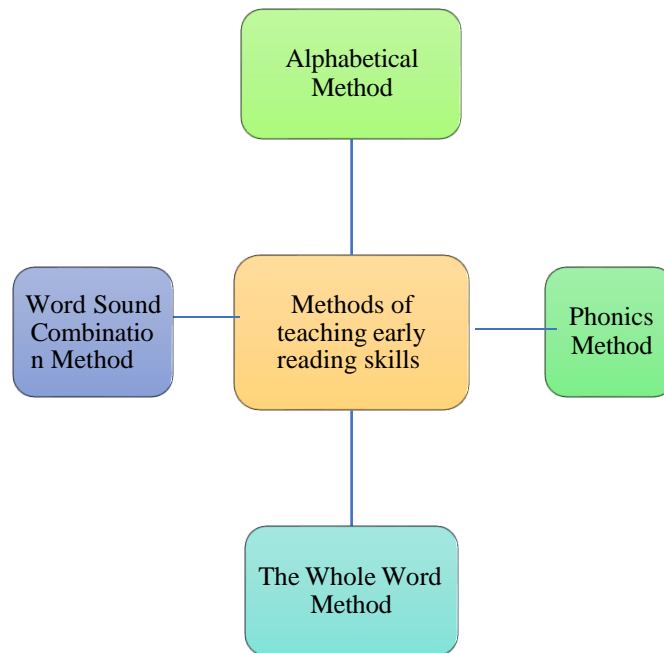
Figure 8. Methods of teaching early reading skills

Alphabetical Method
The alphabet method, also known as the alphabet method, is a traditional method that teaches children to recognise and pronounce the names of the letters of the alphabet. The alphabet method has been used since ancient times and is a traditional method that has existed for centuries (Adams, 1990). In this method, children are taught to recognise upper and lowercase letters and say the names of the letters. For example, children are taught to recognise the letter 'a' and pronounce it as 'a'. After mastering the names of the letters, children are then taught to combine the letters into words.

The alphabet method has advantages because it helps children master the names of the letters and builds a foundation for learning to read. However, this method also has a disadvantage because it does not teach children to recognise the sounds of letters and combine those sounds into words.

Phonics Method
The phonics method, also known as the 'phonics' method, is a method that teaches children to recognise the sounds of letters and combine those sounds into words. The phonics method developed in the 19th century and was introduced by Orton (1937) and Gillingham and Stillman (1997). In this method, children are taught to recognise the sounds of each letter and combine those sounds into words. For example, children are taught to recognise the sounds /k/ /a/ /t/ and combine those sounds into the word 'kat'.

The phonics method has advantages because it helps children master the sounds sof letters and combine those sounds into words. This method also helps children understand word structure and build a foundation for learning

to read. However, the phonics method also has disadvantages because it may require more time for children to master the sounds of the letters and combine those sounds into words.

The Whole Word Method

The whole word method, also known as the 'whole language' method, is a method that teaches children to recognise words as a whole. The whole word method developed in the mid-20th century and was introduced by Goodman (1986). In this method, children are taught to recognise words without having to recognise the letters or sounds. For example, children are taught to recognise the word 'mama' as a whole without having to recognise the letters or the sounds.

The whole word method has advantages because it helps children master words quickly and builds a foundation for learning to read. However, this method also has disadvantages because it does not teach children to recognise the letters or sounds, which may cause children to have difficulty in reading new words.

Word Sound Combination Method

Kaedah Gabungan Bunyi Kata (KGBK), or Integrated Sound-Word Method, is an innovative approach in teaching early Malay literacy introduced by Professor Emeritus Isahak Haron. This method appears as an alternative to the two main approaches in teaching reading and writing, namely the phonics method and the whole word method.

Professor Isahak Haron, an education expert from Universiti Pendidikan Sultan Idris (UPSI) and Universiti Malaya, developed KGBK in 1979 as a response to the literacy problems faced by primary school students in Malaysia. He presented the initial idea of KGBK in a seminar in Kuantan in December 1979 and later published the book 'Mari Membaca' in 1982 based on this approach.

KGBK integrates the advantages of the phonics method and the whole-word method. Unlike the traditional phonics method that teaches all the letters of the alphabet first, KGBK starts teaching with only three popular vowels (a, i, u) and some consonants such as b, c, and k. Pupils are taught to form open syllables such as 'ba', 'bi', 'bu', and then combine them into meaningful words such as 'baba', 'bibi', 'ibu'.

The KGBK learning process is systematic and gradual. Each lesson introduces new letters, forms syllables, and then combines syllables to form words, phrases, and sentences. This approach allows students to read meaningful words quickly while gradually developing 'word attack skills' to read new words independently. The advantage of KGBK lies in its compatibility with the characteristics of the Malay language. The phonemic and regular Malay spelling system, as well as the clear syllable structure, facilitate the application of this method. Professor Isahak emphasised that KGBK allows students to read words, sentences, and short stories in Bahasa Melayu faster than traditional methods.

Studies conducted in Malaysian schools show the effectiveness of KGBK. Most normal students aged 6-7 can master the basic skills of reading and writing Malay within 2-3 months with one hour of teaching a day using this method. KGBK is also proven to be effective for remedial teaching for students who are slow learners or face learning difficulties.

Since its introduction, KGBK has been widely adopted in Malaysia, including in government and private preschools, as well as in the LINUS program for remedial teaching in primary schools. This method has also been adapted for teaching Jawi writing and has received international recognition, with Professor Isahak receiving the ISESCO Literacy Award in 2006 for his contribution to the innovative teaching method of Jawi writing.

In conclusion, KGBK is an important contribution of Professor Isahak Haron in the field of early literacy education in Malaysia. This method has not only helped reduce literacy problems among primary school students but has also paved the way for a more effective and enjoyable approach in teaching reading and writing Malay.

Overall, each method of teaching early reading skills has its own advantages and disadvantages. Therefore, it is important to combine some of these methods to ensure that children get a balanced and comprehensive reading

education. By using different methods, teachers and parents can help children learn reading in a more effective and enjoyable way.

BRAILLE CODE TEACHING METHODS

Braille teaching is an important component of special education for children with visual disabilities. Braille, as a tactile writing system, allows blind or partially sighted individuals to read and write using touch. There are several braille teaching methods that have been developed to help children understand and master this system. These methods include the Grade 1 and Grade 2 methods, the A-J+3+6 method, the Mangold method, the ABKL method, and the dual learning method. Each method has its own characteristics and advantages, and the choice of method depends on the needs and abilities of the individual child. Figure 9 shows the braille code teaching method.
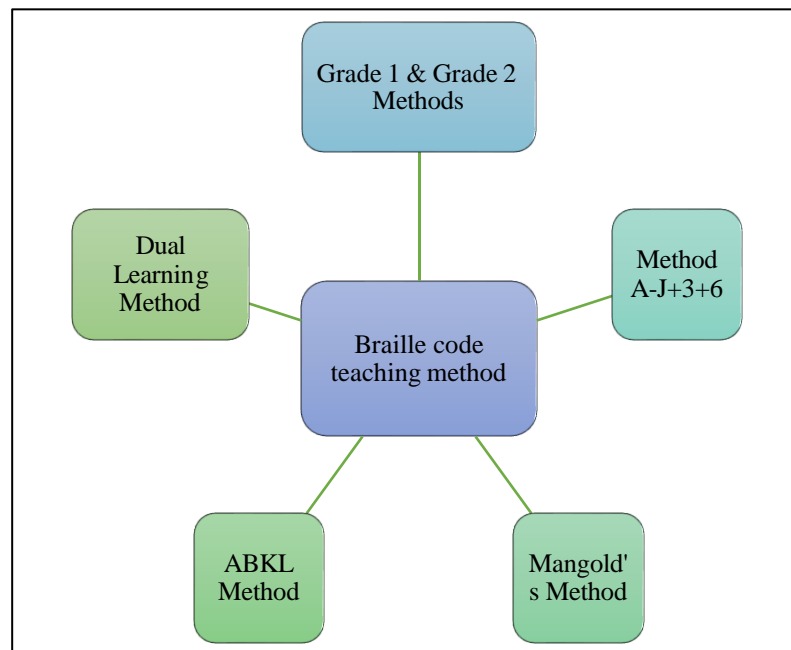

Figure 9. Braille code teaching method

Grade 1 and Grade 2 Methods
The braille system is a tactile writing method that is very important in the world of special education, especially for individuals with visual disabilities. The system is divided into two main grades: Grade 1 (uncontracted) and Grade 2 (contracted), each of which plays a unique role in learning and using braille.

Grade 1 braille, also known as uncontracted braille, is the basis of the braille writing system. It consists of 26 letters of the braille alphabet, representing 'a' to 'z'. In Grade 1, every word is spelled completely using the letters of this braille code, without any abbreviations or contractions (Lowenfeld, Abel, & Hatlen, 1969). This approach makes Grade 1 ideal for beginners just learning braille, as it provides a direct representation of each letter in a word.

The use of Grade 1 braille is very important in the early learning process. It helps children understand the direct relationship between braille and the conventional alphabet, building a solid foundation for literacy skills (Koenig & Holbrook, 2000). In addition, Grade 1 is also useful in learning foreign languages or technical terms where accurate spelling is important. In an educational context, teachers often use Grade 1 to introduce the basic concepts of braille before moving on to more complex forms.

On the other hand, Grade 2 braille, or contracted braille, is a more advanced and complex form of braille. It uses a system of abbreviations and contractions to represent frequently used words or parts of words. The main

purpose of Grade 2 is to save space and speed up reading (Day et al., 2008). For example, the word 'and' can be represented by just one braille cell in Grade 2, compared to the three required in Grade 1.

The use of Grade 2 braille allows skilled braille readers to read more quickly and efficiently. It also significantly reduces the size of printed braille material, which is very important in the publication of braille books and reading materials (Wormsley et al., 2011). However, learning Grade 2 requires more intensive effort and practice than Grade 1, as children need to memorise and understand various abbreviations and contractions.

In the context of learning, the transition from Grade 1 to Grade 2 usually occurs in stages. Children start with the basics of Grade 1 to build an understanding of the structure of braille, then move on to Grade 2 when they have mastered the basics. This process helps children develop comprehensive and effective braille literacy skills.

The choice between Grade 1 and Grade 2 in teaching and learning depends on several factors, including the reader's skill level, the purpose of the reading material, and the context of use. Although Grade 2 is more often used in daily reading materials and braille publications, Grade 1 is still important, especially in the context of early education and language learning (Koenig & Holbrook, 2000).

In conclusion, both Grade 1 and Grade 2 braille play an important role in braille literacy. Grade 1 provides a solid foundation for early learning and situations requiring spelling accuracy, while Grade 2 enables faster and more efficient reading for advanced braille users. An understanding of these two grades is important in planning and implementing effective teaching strategies for children with visual impairments, ensuring a flexible and tailored approach to the child's individual needs in the development of comprehensive literacy skills.

Method A-J+3+6
Louis Braille developed and created a writing system consisting of six raised dots, arranged in two rows and three columns. Each cell contains six dots, numbered 1, 2, 3 on the left and 4, 5, 6 on the right. This system is known as braille code (Figure 10). Louis Braille and his colleagues at the Royal Institution for Blind Youth, Paris, found that reading and writing with these raised dots was easier and faster than reading raised Roman writing. In addition, writing raised Roman script cannot be done by those with vision problems (Birch, 1996).
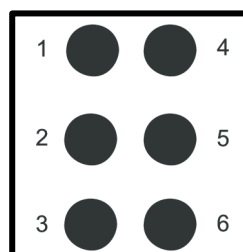

Figure 10. Dots in a braille cell

Braille code is read from left to right, similar to reading Roman writing. The braille alphabet from 'a' to 'z' is formed with a single dot or a combination of several dots. Louis Braille has systematically divided the braille letters from 'a' to 'z' into three lines. The first row consists of the letters 'a' to 'j', which are formed from the combination of the top dots only. The points of the upper part consist of dots 1, 2, 4, and 5. The purpose is to ensure that the dots of the formed braille code are close to each other, facilitating the reading process in the early stages ((Bourgealt, 1969; Lowenfeld et al. 1969). The braille dots from 'a' to 'j' are shown in Table 1 below.

Table 1. Braille codes 'a' to 'j'

a	b	c	d	e	f	g	h	i	j
Dots 1	Dots 1 2	Dots 1 and 4	Dots 1 and 4 5	Dots 1 and 5	Dots 1 2 and 4	Dots 1 2 and 4 5	Dots 1 2 and 5	Dots 2 and 4	Dots 2 and 4 5

To form the next 10 braille letters, Louis Braille added 3 dots to the braille letters from 'a' to 'j', forming the braille letters from 'k' to 't', as shown in Table 2.

Table 2. Braille codes 'k' to 't'

k	l	m	n	0	p	q	r	s	t
Dots 1 3	Dots 1 2 3	Dots 1 3 and 4	Dots 1 3 and 4 5	Dots 1 3 and 5	Dots 1 2 and 3 4	Dots 1 2 3 and 4 5	Dots 1 2 and 3 5	Point 2 3 and 4	Dots 2 3 and 4 5

Next, to form the other six braille codes, Louis Braille added point 6 to the braille codes 'k', 'l','m', 'n', and 'o' to form the braille codes 'u', 'v', 'x', 'y', and 'z' (Table 3). The letter 'w' is not included in this braille code arrangement because, at the time Louis Braille created this system, the letter 'w' did not exist in the French language. Only after the braille code was recognised and introduced to other countries was the new letter 'w' created by adding point 6 to the braille code 'j' (Bourgealt 1969; Lowenfeld et al. 1969; Mangold, 1985).

Table 3. Braille codes 'u' to 'z'

u	v	x	y	Z	w
Dots 1 3 and 6	Dots 1 2 and 3 6	Dots 1 3 and 4 6	Dots 1 3 and 4 5 6	Dots 1 3 and 5 6	Dots 2 4 and 5 6

Mangold's Method

The Mangold method, created by Mangold in 1993, is a specific method for braille code reading skills. In this method, Mangold divides the braille code cell into two parts: the right part as the first part and the left part as the second part, and divides it into three levels, namely the upper level, the middle level, and the lower level (see

Figure 11 below) (Mangold, 1993). The Mangold method requires the braille writer to remember the position of the braille code dots according to section and level, as well as the combination of dots in a braille code.

Mangold's method does not introduce the alphabet in letter order. Instead, it introduces letters according to the position of the braille dots by prioritising the braille code that contains the dots in Part 1 first in the order of top, middle, and bottom levels, then followed by Part 2 in top, middle, and bottom levels.
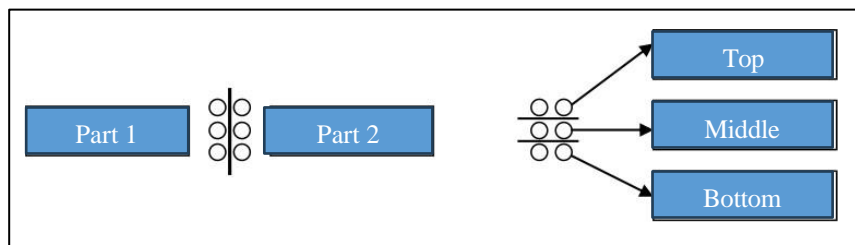

Figure 11. Section of dots in the Mangold Method (1993)

Mangold's learning technique consists of several stages designed to help children understand and master braille writing more effectively. Here are the stages in learning the Mangold method:

Walking the Line Using Both Hands Independently:
Children are taught to follow the lines on a braille page using both hands independently. This helps them to acquire a smooth and light movement on the braille page.

Scrolling Letters from Left to Right Quickly Without Spacing or Spaces:
Children are taught to go through the braille letters from left to right quickly without spacing or spaces. This helps them acquire horizontal reading skills.

Scrolling from left to right on letters, spacing 1 or 2 spaces:
Children are taught to follow the braille letters from left to right with a distance of 1 or 2 spaces. This helps them acquire reading skills with different distances.

Scrolling from Top to Bottom on Consecutive or Different Letters:
Children are taught to go through the braille letters from top to bottom on successive or different letters. This helps them acquire vertical reading skills.

Finding Two Similar or Different Shapes:
Children are taught to find two similar or different shapes on a braille page. This helps them acquire braille shape recognition and structure skills.

Introduction of Letters 'a' to 'g':
Children are taught to recognise braille letters from 'a' to 'g'. This helps them gradually acquire braille recognition skills.

Introduction of Letters 'h' to 'n':
Children are taught to recognise braille letters from 'h' to 'n'. This helps them gradually acquire braille recognition skills.

Introduction of Letters 'o' to 't':
Children are taught to recognise braille letters from 'o' to 't'. This helps them gradually acquire braille recognition skills.

Introduction of Letters 'u' to 'z':
Children are taught to recognise braille letters from 'u' to 'z'. This helps them gradually acquire braille recognition skills.

Distinguishing Letters on a Line:
Children are taught to distinguish braille letters on a line. This helps them acquire reading skills and differentiate braille letters more effectively.

The Mangold method (1993) is a comprehensive and effective method of teaching early braille reading. This method helps children acquire braille letter identification skills in a gradual and systematic manner, ensuring that they master each letter well before proceeding to the next level. By using this method, teachers and parents can help children learn reading and writing more effectively and pleasantly.

ABKL Method (abkl)

In 1989, Kizuka and Oda created the ABKL Method, which was specifically designed to teach braille code to visually impaired students. This method allows them to master the position of braille code dots 1, 2, and 3 first, before gradually introducing dots 4, 5, and 6.

The main characteristics of the ABKL Method are according to the layout of braille code dots, and not classified according to shape similarity or quarter spelling. Braille codes that have the same dot layout characteristics will be included in one teaching session so that students master the braille code faster. For example, this model introduces the letters 'a' (a), 'b' (b), 'k' (k), and 'l' (l) first, where children are only introduced to braille dots 1, 2, and 3 only. Then, children will be introduced by adding dot 4 to 'a' (a), 'b' (b), 'k' (k), and 'l' (l) to produce the other four letters which are 'c' (c), 'f' (f), 'm' (m), and 'p' (p). Table 4 below explains the ABKL Method.

Table 4. ABKL method (abkl)

Roman letters	Braille code	Roman letters	Braille code	Roman letters	Braille code	Roman letters	Braille code	Description
a		b		k		l		Dots 1, 2, and 3
c		f		m		p		With point 4
e		h		o		r		With point 5
kh		kha		u		v		With point 6
d		g		n		q		With points 4 and 5
sy		ah		x		dan		With points 4 and 6
lah		pe		z		ada		With points 5 and 6
se		an		y		kita		With points 4, 5 and 6
me		kan		ng		ta		With point 3
i		j		ny		w		With point 2
s		t		am		apa		With points 2 and 3

Dual Learning Method

The Dual Learning Method, or Dual Media Approach, has emerged as a revolutionary teaching strategy in special education, especially for children with visual disabilities. This method combines the use of braille writing and normal print writing (Rumi writing) in the teaching and learning process, offering a comprehensive and flexible approach (Koenig & Holbrook, 2000). The basic concept of this method involves the simultaneous or alternating use of both forms of writing, aiming to maximise children's access to information and improve their learning efficiency (American Foundation for the Blind, 2024).

The advantages of the dual learning method are diverse and significant. First, it offers flexibility that allows children to switch between braille and print depending on needs and situations (Wormsley, 2011). Second, this method facilitates the integration of children with visual disabilities in the mainstream education environment (American Foundation for the Blind, 2024). Finally, children develop comprehensive skills in both forms of writing, increasing their applicability in a variety of situations (Swenson, 2016). The combination of these advantages makes the dual learning method an increasingly popular option in the field of special education.

In its implementation, teachers use various strategies to optimise the effectiveness of the Dual Learning Method. They provide reading materials in both braille and print formats (Erin & Wright, 2011), teach children to use technological aids that can convert text between the two forms of writing (D'Andrea & Farrenkopf, 2000), and encourage the use of both forms of writing in children's daily activities (Royal National Institute of Blind People, 2022). These strategies help ensure children get a balanced exposure to both forms of writing.

Although beneficial, the dual learning method also faces several challenges. The cost of preparing materials in two formats can be high (World Blind Union, 2024), and teachers need additional training to master both writing systems. In addition, children may face initial cognitive load in mastering two writing systems simultaneously. However, these challenges are often seen as a worthwhile investment given the long-term benefits this method offers.

Advances in technology have brought a new dimension to the Dual Learning Method. Devices such as electronic braille displays and screen reader software have facilitated the transition between braille and print (Hoskin et al., 2024). These developments have increased the effectiveness and efficiency of these methods in the modern learning environment, opening up new opportunities for innovation in teaching and learning.

Research has shown the effectiveness of the dual learning method. Studies have found that children who use this method tend to achieve a higher level of literacy than those who only use one form of writing (Herzberg et al., 2023). Additionally, this approach has been linked to increased self-confidence and social skills among children with visual disabilities. This evidence supports the continued use and expansion of dual learning methods in special education.

In conclusion, the Dual Learning Method offers a holistic and adaptive approach in the education of children with visual disabilities. Despite the challenges in its implementation, the advantages offered by this method make it an increasingly important option in the field of special education. With the development of technology and continuous research, the Dual Learning Method is expected to continue to grow and increase its effectiveness in supporting the literacy and learning of children with visual disabilities. This paves the way for a more inclusive and effective future of education for all children, regardless of their physical abilities.

RESEARCH FINDINGS AND DISCUSSIONS

This study has comprehensively examined various aspects of teaching early reading skills and braille for children with visual disabilities. Through an in-depth analysis of learning theories, early reading skills teaching methods, and braille code teaching methods, this study has produced important and relevant findings in the field of special education.

From a theoretical perspective, this study found that a deep understanding of various learning theories is an important foundation in planning and implementing effective teaching. Piaget's Theory of Cognitive Development and Cognitive Learning (1952, 1970) provides guidance on how children develop cognitively at different ages, helping educators adjust teaching according to children's developmental levels. Behaviourism theory (Skinner, 1953; Watson, 1913; Pavlov, 1927) emphasises the importance of reinforcement and repetition, which proved to be effective in the formation of reading habits and the mastery of braille skills.

Constructivism theory (Piaget, 1952; Vygotsky, 1978; Bruner, 1960) highlights the importance of active learning and the construction of knowledge by children themselves, encouraging a more interactive and student-centred teaching approach. The theory of Nativism (Chomsky, 1957, 1965), although originally developed for language learning, provides an interesting insight into the innate potential of children in learning symbol systems such as braille. Bandura's Social Learning Theory (1977) and Vygotsky's Sociocultural Theory (1978) emphasise the important role of social interaction and gradual assistance in learning, which is very relevant in the context of braille teaching where individual support is often needed.

In terms of teaching methods for early reading skills, this study has identified several main approaches that each have their own strengths and weaknesses. The alphabet method, although traditional, is still relevant in introducing children to the names of letters. However, it is less effective in teaching letter sounds and word formation (Adams, 1990). Phonics methods have been shown to be effective in helping children understand the relationship between letters and sounds, as well as building a solid foundation for reading skills (Orton, 1937; Gillingham & Stillman, 1997).

The Whole Word Method, once popular, offers a different approach by introducing words as complete units. Although this method helps children recognise words quickly, it may cause difficulties in reading new words (Goodman, 1986). KGBK method introduced by Professor Emeritus Isahak Haron offers an interesting approach by combining the advantages of the phonics method and the whole word method, proven to be effective especially in the context of teaching Malay (Haron, 2021).

In the context of braille code teaching, this study has examined some of the main methods that have been developed and used widely. The Grade 1 and Grade 2 braille methods offer a step-by-step approach, where Grade 1 provides a solid foundation before moving on to the more complex but efficient Grade 2 (Holbrook & Koenig, 2000). The A-J+3+6 method offers a systematic approach to introducing braille letters, facilitating the learning process (Lowenfeld, Abel, & Halten, 1969).

Mangold's method, with its detailed approach to dividing braille cells, has been shown to be effective in helping children understand the structure of braille more deeply (Dunnam, 2005). The ABKL method, which focusses on the arrangement of braille dots, has shown effectiveness in accelerating the mastery of the braille code (Kizuka & Oda, 1989). The Dual Learning Method, which combines the use of braille and regular print, has shown promising results in improving the literacy level of children with visual disabilities (Herzberg et al., 2023).

In conclusion, the findings of this study confirm that there is no single method that can be considered "best" for all children, whether in teaching early reading or braille. Instead, the effectiveness of teaching depends on the

ability of educators to choose and combine various methods flexibly and creatively, based on the individual needs of children, their skill level, and the learning context.

CONCLUSION AND RECOMMENDATION

In conclusion, this study has opened the curtain to a deeper understanding of the teaching of early braille reading skills for children with visual disabilities, revealing various critical aspects in this field of special education. More importantly, this study aligns efforts in this area with broader global goals, particularly Sustainable Development Goal (SDG) 4, which emphasises quality education that is inclusive and equitable for all.

Through thorough research, this study has succeeded in producing findings that are not only important but also relevant in the current context. An in-depth analysis of learning theories, early reading skills teaching methods, and braille code teaching methods has produced a comprehensive synthesis of knowledge. The main findings show that a flexible and adaptable approach in teaching is the key to effectiveness. The integration of various theories and methods to meet the individual needs of children is no longer an option but a necessity in this era of modern education, in line with the principles of SDG 4, which emphasises access to quality education for all.

The objectives outlined at the beginning of the study have been successfully achieved, proving the correct direction of this research. Success in identifying and analysing relevant learning theories, examining various teaching methods, producing practical recommendations, and relating findings to the broader context of inclusive education has contributed to the formation of a strong base for a deeper understanding of the teaching of early reading skills. braille. This achievement directly supports global efforts to ensure quality and inclusive education, as outlined in SDG 4.

The literature review methodology used in this study has proven its effectiveness in producing comprehensive and relevant findings. This approach enables critical analysis of various sources, opening up space for the synthesis of information from various perspectives. As a result, this study not only provides a current overview of the field but also paves the way for future research that can more effectively support the achievement of SDG 4.

In terms of practical implications, the findings of this study are like a landmark that shows the direction for improvement in the field of special education. The need for more comprehensive teacher training, the use of more flexible teaching approaches, the integration of technology, and the development of innovative teaching materials are all concrete steps that can be taken to improve the quality of teaching early braille reading skills in schools. These measures directly support the goal of SDG 4 to improve the quality of education and ensure lifelong learning opportunities for all.

The social implications of this study go beyond the walls of the classroom, reaching towards the formation of a more inclusive society. Improvements in the teaching of early braille reading skills are not just about literacy but also about opening wider doors of opportunity for children with visual disabilities. It is about building a bridge to a future where every individual, regardless of physical ability, can contribute meaningfully to society. This effort is aligned with the goal of SDG 4 to ensure inclusive and equitable education, as well as promote lifelong learning opportunities for all.

Although this study has produced valuable findings, it is important to acknowledge its limitations. The literature review nature of this study, although comprehensive, may not fully capture the current reality in the classroom. However, this limitation is not an obstacle but rather a catalyst for more in-depth and specific research, which can contribute to the achievement of SDG 4 more comprehensively.

Thus, some recommendations for future research have been highlighted. The need for longitudinal studies, empirical comparisons of various methods, research on technology integration, and studies that take into account children's own experiences are all potential avenues to explore and further develop our understanding of teaching

early braille reading skills. This research can help produce more effective strategies to achieve the goals of SDG 4, especially in the context of special education.

In conclusion, this study is not just an academic survey but a step towards building a brighter future for children with visual disabilities, in line with the aspirations of SDG 4. It emphasises the importance of a flexible, innovative, and student-centred approach in teaching skills in early braille reading. More than that, it is a call to action- an invitation to educators, researchers, and policymakers to continue working towards a truly inclusive and effective education system. By taking into account the findings and recommendations of this study, we can not only improve the literacy of children with visual disabilities but also support the development of a more inclusive and equitable society, in line with the goals of SDG 4. Finally, this study opens a new chapter in our journey to ensuring that every child, regardless of their physical ability, has the same opportunity to reach their full potential and build a brilliant future, thereby contributing to the achievement of SDG 4 and sustainable development as a whole.

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