INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH & DEVELOPMENT

Enhancing Reading Comprehension: Visual Documentation Approaches for Children with Reading Difficulties and Disabilities

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Abstract:
This study explores the effectiveness of visual documentation approaches in enhancing reading comprehension for children with reading difficulties and disabilities. This study aims to investigate how integrating visual elements alongside text can improve the reading experience for these children. In the methodology, a sample group of children with varying reading difficulties and disabilities was selected to participate in a series of reading comprehension tasks using visual documentation approaches. The study used qualitative case study research to analyze the impact of these approaches on the participants' reading comprehension skills through pre- and post-studio-based assessments, observation, and feedback collection. The findings of this study indicated that incorporating visual documentation approaches significantly improves the reading comprehension abilities of children with reading difficulties and disabilities. Participants showed higher engagement, better retention of information, and increased understanding of textual content when visual elements were introduced. The data collected suggests that visual documentation approaches can be a valuable tool in supporting these children's learning needs. Visual documentation approaches have demonstrated a positive impact on enhancing reading comprehension for children with reading difficulties and disabilities. By leveraging visuals alongside text, educators and parents can create a more inclusive and effective learning environment for these children. It is recommended that further research be conducted to explore additional strategies and best practices for integrating visual documentation into literacy instruction for children with diverse learning needs.

Keywords: Reading comprehension, reading difficulties and disabilities, children's educational interventions, studio-based assessments, visual documentation

1. Introduction

Reading comprehension is a fundamental skill crucial for academic success and lifelong learning. However, for children with reading difficulties and disabilities, mastering this skill can be a daunting challenge. Reading difficulties encompass a broad spectrum of learning differences, including dyslexia, attention-deficit/hyperactivity disorder (ADHD), specific language impairment, and other cognitive or neurological conditions (Kearns, 2023; Gray & Climie, 2016; Logsdon, 2022). These challenges often manifest as struggles with decoding, fluency, vocabulary acquisition, and, most importantly, understanding and interpreting textual information (Woolley, 2011; Pritchard, 2013).

Traditional approaches to addressing reading difficulties have primarily focused on remedial instruction, such as phonics-based interventions and reading comprehension approaches (Almutairi, 2018; Wanzek et al., 2017). While these methods have proven beneficial for many learners, they may not adequately meet the needs of children with more profound reading disabilities or those who require alternative modes of learning (Al Otaiba et al., 2021). In recent years, there has been a growing recognition of the importance of incorporating visual documentation approaches to support these individuals in comprehending reading material effectively (Lindström-Sandahl et al., 2023; Schiff & Joshi, 2016).

Smith (2019) is of the view that visual documentation refers to the use of visual aids, graphics, and multimedia tools to represent textual information in a more accessible and comprehensible format. These techniques harness the power of visual learning, leveraging individuals' innate cognitive abilities to process and retain information more efficiently. Visual documentation, whether as a supplement or substitute for traditional text-based content, provides a

comprehensive approach to enhancing reading comprehension. It caters to various learning styles and abilities by incorporating visually engaging materials. The significance of visual documentation in the context of reading difficulties and disabilities lies in its potential to address the underlying cognitive processes implicated in reading comprehension challenges (Abdul Samat & Abdul Aziz, 2020; Duchek, 2019). Research suggests that individuals with reading difficulties often exhibit weaknesses in areas such as working memory, attention, and visual-spatial processing (Bakriev, 2023). Visual documentation approaches capitalize on these strengths and compensate for weaknesses by providing scaffolded support and facilitating meaningful connections between text and visuals.

One potential fissure in reading comprehension for children with reading difficulties and disabilities is the lack of in-depth exploration into the specific effectiveness of different types of visual documentation techniques (Schiff & Joshi, 2016; Connor et al., 2014). While existing studies generally suggest that visual documentation approaches can improve reading comprehension for children with difficulties, there is limited research comparing the efficacy of various visual aids such as graphic organizers, visual schedules, and multimedia aids. For instance, while some studies may focus on the benefits of graphic organizers, others may examine the impact of visual schedules or multimedia presentations (Gruhn, Segers & Verhoeven, 2019). However, there is a gap in research that directly compares these different types of visual documentation techniques to determine which ones are most effective for different subsets of children with reading difficulties and disabilities (Werpup-Stüwe & Petermann, 2015; Nediger, 2020; Vaughn & Barnes, 2023). This gap presents an opportunity for further investigation to provide educators and practitioners with evidence-based guidance on selecting the most suitable visual documentation approaches to meet the diverse needs of children with reading difficulties and disabilities (Stein, 2022; Al Otaiba et al., 2021).

Despite the growing interest in visual documentation as a means of enhancing reading comprehension, there remains a need for empirical research to validate its effectiveness and explore its practical applications in educational settings. This study aims to fill this gap by examining the role of visual documentation approaches in supporting children with reading difficulties and disabilities (Alghonaim, 2020). Through a comprehensive review of existing literature, theoretical framework, and empirical studies, this study sought to investigate how the integration of visual elements alongside text can improve the reading experience for these children, elucidate the cognitive mechanisms underlying visual documentation's efficacy and identify best practices for implementation.

2. Literature Review

2.1. Theoretical Framework

In the context of this study, Universal Design for Learning (UDL) as a theoretical framework played a crucial role in guiding the selection and implementation of visual documentation approaches. UDL emphasized the importance of providing multiple means of representation, expression, and engagement to accommodate the diverse needs and preferences of learners (Quirke & McCarthy, 2020). Sanger (2020) discusses that visual documentation approaches inherently align with UDL principles by offering alternative representations of text that cater to the varying needs of children with reading difficulties and disabilities. The integration of visual documentation approaches within a UDL framework supports three (3) main approaches: multiple means of representation (MMRe), multiple means of expression (MMEx) and multiple means of engagement (MMEn) (Almeqdad et al., 2023; Al-Azawei, Serenelli & Lundqvist, 2016).

Valente and Danforth (2016) probe that inclusive learning environments aim to support all children, regardless of their reading abilities or disabilities. The MMRe visual documentation approach goes beyond the traditional written text, offering alternative ways to present information. Through graphic organizers, visual schedules, pictorial representations, and multimedia aids, this approach enhances understanding for children facing reading difficulties and disabilities. The emphasis on visual presentation caters to learners who may find traditional text-based materials challenging, providing alternative pathways for understanding (Almutairi, 2018; Qu & Cross, 2024).

MMEx visual documentation approach advocates for allowing children to express their understanding and knowledge in various ways. This visual documentation approach not only facilitates comprehension but also provides opportunities for children to express their understanding through visual means (O'Connell, 2013). For example, children can create their own graphic organizers or visual summaries to demonstrate their comprehension of reading materials. This visual documentation approach empowers children with reading difficulties and disabilities to showcase their understanding in ways that align with their strengths and preferences (Dunlosky et al., 2023; Bukhari, 2018).

On the other hand, MMEn visual documentation approach encourages educators to design learning experiences that foster engagement and motivation among all children. This visual documentation approach enhances engagement by making learning materials more visually appealing and interactive (Frimpong, 2021). For instance, incorporating multimedia elements such as videos, animations, and interactive graphics can capture children's interest and maintain their attention during reading activities. This provision of engagement and accessible learning experiences helps this visual documentation approach to promote active participation and learning among children with reading difficulties and disabilities (MacDonald et al., 2020). The study implemented these practical approaches informed by UDL principles to create inclusive learning environments where all children, including those with reading difficulties and disabilities, have equitable access to reading materials and opportunities for comprehension development.

2.2. Reading Disabilities

Reading disabilities, often referred to as dyslexia or specific learning disabilities in reading, are neurological conditions that affect a person's ability to read fluently and with accuracy despite normal intelligence and adequate education (Hulme & Snowling, 2016). These disabilities can manifest in various ways, including difficulties with

phonological processing, decoding words, recognizing sight words, spelling, and understanding written text. Individuals with reading disabilities may struggle with tasks such as reading aloud, comprehending written material, and expressing themselves in writing. There is no single cause of reading disabilities, as they are believed to result from a combination of genetic, neurological, and environmental factors (Stabel et al., 2013; Gertners, 2021). Research suggests that differences in brain structure and function, particularly in areas involved in language processing, may contribute to the development of reading disabilities (Cao, 2023; Kunwar, Pokhrel & Sapkota, 2023). Additionally, environmental factors such as early exposure to literacy experiences, instructional methods, and family support can influence the severity and persistence of reading difficulties (Krishnan, Watkins & Bishop, 2016; Tong et al., 2023).

Early identification and intervention are crucial for supporting individuals with reading disabilities. Educators and specialists use a variety of assessment tools to diagnose reading disabilities and develop personalized intervention plans tailored to the individual's strengths and weaknesses (Snowling, 2012). These interventions often include explicit instruction in phonemic awareness, phonics, vocabulary, comprehension, and fluency, as well as accommodations and assistive technologies to support reading and learning. While reading disabilities present significant challenges, many individuals with dyslexia and related conditions can learn to read effectively with appropriate support and instruction (Lindstrom, 2018; Muktamath et al., 2024). With early intervention, targeted interventions, and ongoing support, individuals with reading disabilities can develop the necessary skills to succeed academically and lead fulfilling lives. Additionally, raising awareness and promoting understanding of reading disabilities can help reduce stigma and ensure that individuals receive the support and accommodations they need to thrive (Miciak & Fletcher, 2020).

2.2.1. Instruction Approaches to Support Schoolchildren with Reading Disabilities

It is imperative that instructional approaches aimed at assisting schoolchildren with reading disabilities are grounded in empirical evidence, implemented in a methodical manner, and customized to address the unique requirements of each schoolchild (Hornery et al., 2014). This means that interventions and strategies are used to support effective ways of improving reading skills in schoolchildren with disabilities (Horn, Roitsch & Murphy, 2021). The instructional approaches consistently and flexibly create a supportive learning environment that empowers schoolchildren with reading disabilities to build essential reading skills and achieve academic success (Connor et al., 2014). Some of the instructional approaches are:

- Multi-sensory: This approach utilizes methods that engage multiple senses simultaneously, such as the Orton-Gillingham approach, which integrates visual, auditory, and kinesthetic elements to teach phonemic awareness, decoding, and spelling. This is a powerful teaching approach that engages more than one sense simultaneously. It goes beyond traditional methods by incorporating sight, hearing, touch, and even smell (Fisher, 2016). Some key aspects of multi-sensory instruction include visual approaches, such as using visual aids like charts, diagrams, graphic organizers, images, videos, etc., to support learning. Visual cues help schoolchildren understand concepts. Auditory techniques also incorporate rhythm, music, chants, listening exercises, reading text aloud, and auditory reinforcement. Auditory input supports learning for schoolchildren who benefit from hearing. Hands-on/Kinesthetic activities help schoolchildren to manipulate objects, do experiments, play interactive games, write, draw, and otherwise engage in tactile learning. Kinesthetic learning is powerful for bodily-kinesthetic learners (Institute of Multi-Sensory Education (IMSE), 2020).

  Richland (2024) states that multi-sensory reading/spelling uses methods like Orton-Gillingham that incorporate seeing, hearing, saying, and touch to teach reading and spelling skills. Hand motions paired with letter sounds help cement phonics concepts. Lesson design helps integrate visual, auditory, and kinesthetic components to accommodate different learning styles. Careful sequencing and pacing of the multi-sensory input are important. Assessment using multi-sensory techniques to assess schoolchildren's skills and implement targeted intervention. The key advantage of multi-sensory techniques is that they allow students to utilize their strongest modalities to support weaker areas. Actively engaging multiple senses helps information stick better in memory. With multi-sensory instruction, schoolchildren use multiple senses to make connections and learn concepts. It recognizes that not all learners rely solely on reading or listening. Instead, it aims to activate various sensory pathways. Many reading programmes designed for struggling readers employ multi-sensory teaching methods. These programmes enhance comprehension and skill development by combining visual, auditory, and kinesthetic elements (Cassese-Pawlowski, 2018).

- Explicit Phonics Instruction: Fletcher, Savage and Vaughn (2020) share that explicit phonics instruction is a systematic and structured approach to teaching reading that focuses on explicitly teaching the relationships between sounds and letters. This method emphasizes the foundational skills necessary for decoding and encoding words, which are essential for developing proficient reading and spelling abilities. In explicit phonics instruction, teachers provide direct and systematic instruction in phonemic awareness, phonics, decoding strategies, and word analysis skills (Kasprick, 2023). This approach provides direct and explicit instruction in phonics, focusing on teaching the relationships between sounds and letters, syllable types, and phonetic patterns to improve decoding skills. Explicit phonics instruction typically unfolds in many ways (Sprig Learning, 2023). They are as follows:

  ✓ Phonemic Awareness – Before delving into phonics instruction, students need to develop phonemic awareness—the ability to identify and manipulate individual sounds (phonemes) in spoken words. Teachers led activities such as rhyming, blending, segmenting, and manipulating sounds orally to develop students' phonemic awareness skills (Schiff & Joshi, 2016).

  ✓ Letter-sound Correspondence – Explicit phonics instruction begins by teaching students the correspondence between letters (graphemes) and their corresponding sounds (phonemes). Teachers introduce letter-sound

relationships systematically, starting with the most common correspondences and progressing to more complex ones.

✓ Decoding Strategies – Schoolchildren learn decoding strategies to sound out words by blending individual sounds together. Teachers model and explicitly teach strategies such as sounding out, blending, segmenting, and using letter-sound patterns to decode unfamiliar words.

✓ Word Analysis Skills – In addition to decoding individual words, schoolchildren learn word analysis skills to recognize patterns and structures within words. This includes teaching schoolchildren about syllable types, common prefixes and suffixes, and how to apply morphological rules to decode and understand words.

✓ Decodable Texts – Schoolchildren practise applying their phonics skills by reading decodable texts that contain a high proportion of words with the letter-sound patterns they have been taught. Decodable texts provide opportunities for students to practice applying their decoding skills in context and gradually build fluency and comprehension.

✓ Spelling Instruction – Explicit phonics instruction also includes spelling instruction, where students learn spelling patterns, rules, and strategies for encoding words. This involves teaching schoolchildren how to segment words into sounds and represent those sounds with corresponding letters.

✓ Assessment and Differentiation – Throughout phonics instruction, teachers regularly assess schoolchildren's progress and adjust instruction based on individual needs. Differentiated instruction may involve providing additional support or enrichment activities, targeted interventions, or accommodations to meet the diverse learning needs of students.

• Structured Literacy Programmes: Structured literacy programmes are evidence-based instructional approaches designed to teach reading, writing, and spelling systematically and explicitly. These programs are particularly effective for individuals with dyslexia and other reading difficulties, as they provide systematic instruction in the fundamental components of language, including phonology, phonics, morphology, syntax, and semantics. Implement structured literacy programmes that systematically teach the structure of the English language, including phonology, morphology, syntax, and semantics, such as the Wilson Reading System or the Barton Reading & Spelling System (Manuel, 2022; Spear-Swerling, 2021).

• Repeated Reading: It is a reading strategy that involves reading a text multiple times to improve fluency, accuracy, and comprehension. This strategy is particularly effective for students who struggle with reading fluency, such as those with dyslexia or other reading difficulties. This approach offers opportunities for repeated reading of texts at the appropriate instructional level to enhance fluency and automaticity, which can improve reading comprehension (Gediki & Akyol, 2022; Almutairi, 2018).

• Decoding and Word Recognition Strategies: Decoding and word recognition strategies are essential skills for proficient reading (Elson et al., 2024). These strategies help readers identify and understand words in written text, particularly when encountering unfamiliar words or words with irregular spelling patterns. Teach students decoding strategies, such as chunking words into smaller parts, using context clues, and recognizing common prefixes, suffixes, and root words to aid in word recognition (Juel & Minden-Cupp, 2000).

• Visual Supports: Visual supports are tools and aids that use visual elements to enhance understanding, communication, and learning for individuals with diverse needs, including those with reading difficulties or disabilities (Bower, 2017). These supports provide visual cues, prompts, and representations to complement verbal instructions or information. This approach provides visual aids such as graphic organizers, word walls, and color-coding to reinforce concepts, support vocabulary development, and enhance comprehension (Bobek & Tversky, 2016).

• Assistive Technology: Integrate assistive technology tools such as text-to-speech software, speech recognition programmes, audiobooks, and screen readers to accommodate individual needs and provide access to written material (Akpan & Beard, 2013).

• Comprehension Strategies: Teach explicit comprehension strategies such as summarization, prediction, questioning, and making connections to improve understanding of the text (Almutairi, 2018).

• Peer Tutoring and Cooperative Learning: Draper (2022) shares that this approach encourages learning activities where students with reading disabilities can work collaboratively with peers to support each other's learning.

• Individualized Instruction and Progress Monitoring: Taylor, Yeung and Bashet (2021) provide personalized instruction based on ongoing assessment of students' strengths and weaknesses, and adjusting instruction is needed to address specific areas of difficulty and monitor progress over time.

• Positive Reinforcement and Motivation: Provide frequent encouragement, positive reinforcement, and opportunities for success to build students' confidence and motivation to engage in reading activities (Filgona et al., 2020).

• Parent and Family Involvement: Collaborate with parents and families to reinforce reading skills at home, share strategies for supporting literacy development, and promote a supportive home environment for reading.

3. Methods

The study's approach involved the use of qualitative case study research (Baxter & Jack, 2015), which provided a detailed and in-depth analysis of the impact of visual documentation approaches on the reading comprehension skills of children with reading difficulties and disabilities (Kim & Chung, 2023; Williamson, Given, & Scifleet, 2018). This research method was combined with studio-based procedures for designing reading comprehension performance (Ball et al., 2021). This research method provided valuable insights into the lived experiences and individualized effects of visual documentation approaches on participants of the study. The study identified a subset of participants to serve as case study

participants. The study selected cases that represent a range of demographic characteristics, severity of reading difficulties, and responses to visual documentation interventions (Gediki & Akyol, 2022).

Thus, the early childhood education (ECE) level, which includes children from three (3) to age eight (8), was the center of the study's focus. As a result, the reading material's design was geared toward the Early Childhood students at the Presbyterian Basic School, Kiddie International School, and International Community Montessori School, all of which were located in Anaji-Takoradi, Ghana. However, more emphasis was placed on early childhood learners at the International Community Montessori School of the Special Education Needs and Disability department since they have a department with a diagnosis of certain disabilities in learning, such as autism and delay in speech (Frimpong, 2021).

Given the study's focus on aiding young children with reading impairments in early childhood education, it specifically targeted this population for interviews. A total of twenty (20) individuals were selected for interviews. As the study primarily adopted a qualitative approach, the sample size was not determined by statistical considerations but rather by the desire to gather rich and insightful information. Hence, the emphasis lies not on the quantity of data collected but on the depth and quality of the information sought (Vasileiou et al., 2018).

Employing a purposive sampling method (Nikolopoulou, 2022), the study deliberately selected four (4) early childhood facilitators, three (3) parents of early childhood learners, three (3) school heads, and ten (10) Early Childhood learners, spanning from Kindergarten (KG) 1 to Basic 2. This selection process aimed to ensure a diverse representation of key stakeholders directly engaged in early childhood education. The inclusion of these participants was pivotal, aligning with the study's objective of improving school-based activities and highlighting the integral role of schools in the research context. The study conducted in-depth interviews with case study participants to explore their experiences, perceptions (Jamshed, 2014), and challenges related to reading comprehension and the use of visual documentation. It used open-ended questions to encourage participants to reflect on their reading experiences, the effectiveness of visual aids, and any changes in their reading habits or attitudes.

The study collected additional data through participant observation during intervention sessions, allowing researchers to observe participant engagement, interactions with visual documentation materials, and any difficulties encountered (Romero-Ternero et al., 2022). These data were then developed into studio-based processes and allowed for the creation of engaging and hands-on activities that actively involved the participants in the learning process (Finkel & Or, 2020). This approach not only helped to assess the effectiveness of visual documentation approaches but also provided a platform for interactive learning experiences that catered to the diverse needs and learning styles of the participants (Gijbels et al., 2021). The study employed visual analysis that involved interpreting and understanding visual information, such as images, charts, graphs, or other visual representations, to derive meaning, identify patterns, and draw conclusions (Venkatesh & Ma, 2021). This analysis involved providing a detailed account of the elements observed, including their arrangement, size, scale, and proportion. It was used to identify any discernible patterns or relationships among the visual elements.

The study ensured that all research participants, including children and their parents or legal guardians, provided informed consent before participating in the study (Manti & Licari, 2018). This activity involved providing detailed information about the research objectives, procedures, potential risks and benefits, and their rights as participants. The study protected the privacy and confidentiality of participants' information. The study treated all research participants with dignity, respect, and sensitivity. It recognized the potential vulnerability of children with reading difficulties (Schiff & Joshi, 2016) and disabilities and ensured that their participation was voluntary. It took measures to minimize any potential discomfort or distress during data collection (Arellano, Alcubilla, & Leguízamo, 2023).

4. Results and Discussion

This section outlines the process of designing and creating educational materials for children, including rhyme books, sight word flashcards, picture cards, wall charts, and coloring books. The aim was to adhere to the standards of children's book production. To accomplish this, the researchers followed a systematic approach, resulting in the development of various materials:

- A 30-page rhyme book featuring appropriate illustrations, text design, and finishing.
- A 22-page colouring book with engaging illustrations and suitable designs.
- A sound pad containing recordings of seven animal sounds, one fruit sound, and two welcoming sounds.
- A word game comprising 54 sight words to enhance vocabulary skills.
- Additionally, the researchers produced 32 Constant-Vowel-Consonant (CVC) word cards for each vowel sound (a, e, i, o, u).

Through this methodical process, the researchers successfully created a range of educational resources aimed at facilitating learning and engagement among children.

Sight Words for Word Game from the Rhyme Book					
Bee	Tiny	Seed	Apple	Leaves	Bumble
Eat	Room	Hard	Juicy	Thumb	Appetite
Leg	Nest	Know	Pollen	Nectar	Hayloft
Lay	Grow	Hung	Wheat	Could	Huddle
Way	Bite	Copy	Black	Should	Feather
Not	Cold	Wings	Table	Dickie	Garden
You	Said	Chick	Bloom	Hungry	Chicken
Big	Next	Chair	Nature	Animal	Squirrel
Ate	Gold	Great	Shine	People	Behind

Table 1: A Sample of the Text Narrative for Sight Words for Word Game from the Rhyme Book

Consonant Vowel Consonant (CVC) Words List	
Short 'a' CVC Words	*Short 'e' CVC Words*
Can had lag dab lab nag jab pad sag lab mad rag tab rad tag nab sad hag tad wag sam bad bag dam dad gag ham hat mat fan	Bed beg pen wed leg ten fed peg hen led keg zen red meg ken ted neg yen zed ben bet jed den get ned men jet ket pet vet
Short 'i' CVC Words	*Short 'o' CVC Words*
Bib lid zig fib rib dim big him jib dig kim kin aid sim sib fig rim bid pig jim did rig tim hid wig vim gin kid jig bin	Cob gob job lob mob rob sob dog fog jog log cop hop hop mpo pop top cot dot hot not pot god rod pod mod cod bop lop cot
Short 'u' CVC Words	
Cub sub pub dud bug jug hub tub dub mud dug lug rub nub bud cud hug mug pug rug tug gum gum mum sum num hum rum tum lum bum fun yum	

Table 2: A Sample of the Text Narrative for Consonant Vowel Consonant (CVC) Words Flash Cards

4.1. Stages in the Production of the Reading Material

4.1.1. Pre-Studio Assessment Stage

This stage marked the inception of the production process, representing the initial step in the entire endeavour. Termed as the exploratory stage, it encompassed thorough investigations and the gathering of specific components essential for creating the designated resource material. Additionally, this stage involved formulating a plan for executing sketches, generating required thumbnails, and assembling necessary tools and materials for print media production. To fulfill the study's objectives, the text served as a blueprint, ensuring alignment between design illustrations and textual content within the reading book. The narrative provided guidance for accurately placing all elements and their corresponding visual components during the production process (Duchek, 2019).

4.1.1.1. Sample One – Text Narrative for the Reading Material

Apples
Let's spell: a–p-p-l-e-s

APPLE TREE
Way up high in the apple tree. Two red apples smiled at me. I shook that tree as hard as I could. Down came the apples, Mmmm---were they good!

APPLES APPLES
Apples. Apples. Good to eat. Apples, apples, Juicy and sweet. Pluck them off a tree. Buy them at a store. Apples, apples, we want more!

EAT AN APPLE
Eat an apple, save it core. Plant the seeds and grow some more. Eat an apple, save it core. Plant the seeds and grow some more.

Bees
Let's spell: B–e-e
BUZZING BEE

BUZZ! Goes the bee, hour after hour. BUZZ! Goes the bee, flower from flower, sucking out the nectar, flying it home, storing up the nectar in the honeycomb.
BUZZ! Goes the bee, making honey so sweet. Bee makes the honey that I love to eat!

BUMBLE BEE
Bumble bee, bumble bee, yellow and black, four buzzing wings you have on your back. Looking for nectar in flowering blooms, pollen-filled legs that will need a good groom. Helping our fruits and vegetables grow, too, pollinating daily. What else do you do?

BUZZY BEE
Buzzy Bee, Buzzy Bee, Buzz on the flowers. Buzz on the tree. Buzz on the table. Buzz on the chair. Buzz in the room. Buzz in my bag. But NOT on my hair. Buzzy bee, buzzy bee.

Bird
Let's spell: B-i-r-d
BIRD TALK
"Think..." said Robin, "think..." said Jay, sitting in the garden talking one day. Think about people and the way they grow: They don't have feathers at all, you know. They don't eat beetles. They don't grow wings; they don't like sitting on wires and things."
"Think..." said Robin, "think..." said Jay. "Aren't people funny to be that way? (Fisher, 2010)
IF I WERE A BIRD
If I were a bird, I'd sing a song. And fly about. The whole day long
And when the night came. Go to rest. Up in my cosy little nest.

TWO LITTLE DICKIE BIRDS
Two little dickie birds are sitting on a tree. One named Peter, One named Paul.
Fly away Peter, fly away Paul. Come back Peter, come back Paul.

Chick
Let's spell: c–h-i-c-k
THE CHICKS
Baby chicks sing... "Pio, pio, pio, Mama we are hungry, Mama we are cold."
Mama looks for wheat; Mama looks for corn; Mama feeds them dinner; Mama leaps them warm. Under Mama's wings, sleeping in the hay, Baby chicks all huddle until the next day (Al Otaiba et al., 2021).

CHICK CHICK CHICKEN
Chick, chick, chick, chick, chicken, lay a little egg for me, chick, chick, chick, chick, chicken
I want one for my tea. I haven't had an egg since Easter, and now it's half past three, so, chick, chick, chick, chick, chicken, lay a little egg for me (Foundation stage forum (FSF, 2008).

I'M A LITTLE CHICK
I'm a little chick, yellow and soft. I was born in a hayloft. I play all day and I cheep, cheep, cheep. Then back to the barn, where I sheep, sleep, sleep.

Butterfly
Let us spell: b–u-t-t-e-r-f-l-y
BUTTERFLY BUTTERFLY
Butterfly, butterfly. Where do you come from? "I know not, I ask not,
Nor ever had a home." Butterfly, butterfly. Whence do you go? "Where the sun shines and where the buds grow."

MY BUTTERFLY
You crawled out from a tiny egg with a great big appetite. You ate and ate so many leaves until you could not bite. You hung down from a little branch.
And formed a chrysalis to grow. You evolved into a butterfly. I hate to let you go!

BUTTERFLY, BUTTERFLY
I saw a butterfly sitting on my thumb. She flew away and then there was none. Butterfly, butterfly, fly away. Butterfly, butterfly, happy all day.

Squirrel
Let's spell: S–q-u-i-r-r-e-l

ACORN

A little acorn was sitting in a tree; along came Mr. Squirrel, as hungry as could be. Then, the fall winds blew and rustled all the leaves. Down came an acorn; Mr. Squirrel was pleased!

LITTLE ACORNS
Three (3) little acorns were lying on the floor; one (1) got lost, and then there were two (2). Two (2) little acorns were lying on the floor; one (1) got lost, then there was one (1).
One (1) little acorn was lying on the floor; one (1) got lost, and there is none! Mr. Squirrel happily ate them all.

FURRY FURRY SQUIRREL
Furry, furry squirrel, Hurry, hurry, hop. Scurry up the tree trunk to the very top.
When you reach the branches, hurry, turn around. Furry, furry squirrel Scurry to the ground (Rhyming Reasor, 2020; Sunday observer, 2016).

Mouse
Let's spell: m–o–u-s-e

QUIET MOUSE
Here's a quiet little mouse. Living in a quiet little house. When all was quiet
As could be, BOO! Out popped he!

GRAY MOUSE, BROWN MOUSE
Look! There's a gray mouse. He lives in the house. He's happy, fat and glad.
Brown mouse comes in and does a spin. Now, the gray mouse looks sad. Brown mouse teaches him. Now he can spin on a whim. Gray mouse is happy, again.

LITTLE CLAPPING MOUSE
Behind the tree and under the house, there lived a teeny, tiny Mouse. She loved to sing; she loved to tap. But most of all, she loved to clap. She clapped all night; she clapped all day. She clapped to frighten the cat away! (Rhyming Reasor, 2020)

4.1.2. Studio-Assessment Stage

4.1.2.1. Pre-layout and Planning
During this stage, the researchers collected pertinent details regarding the reading material, taking into account factors such as the project's objectives, the intended audience, substrate type, typography, and illustrations. Additionally, they considered the content, layout format, dimensions, number of pages, copies, finishing requirements, layout specifications, estimated completion time, and deadline for the reading materials. Utilizing this pre-layout information, the researchers formulated a comprehensive plan, gathering the necessary tools and materials required for executing the project while simultaneously working on the gathered data (Dunlosky et al., 2023).
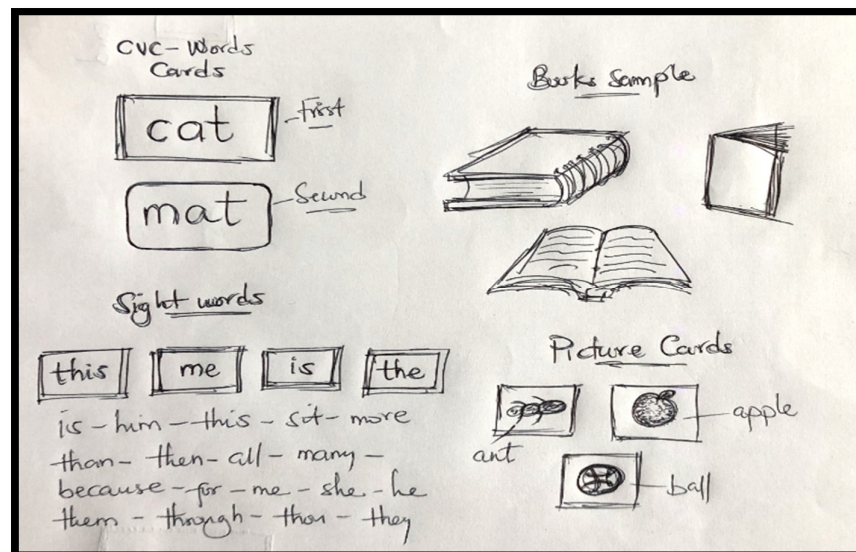

Figure 1: Planning Sketches, Free Hand Made with Pen
Source: Field Work, 2023

4.1.2.2. Preliminary Designs – Thumbnail Sketches

The researchers generated conceptual designs to guide the actual design implementation process. This concept was developed through thumbnail sketches, rough layouts, and comprehensive layout stages. During this phase, the researchers conceptualized rough ideas of the final design appearance, providing an opportunity to experiment or create a prototype of the concept. Thumbnail sketches marked the initial stage of production, where various arrangements of design elements were drawn, with one ultimately selected for further development.
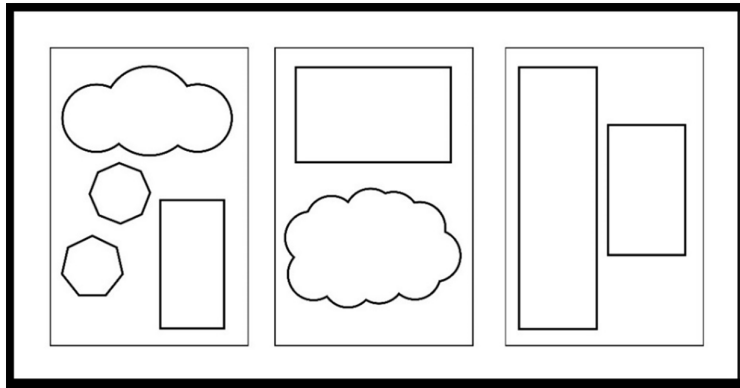
Figure 2: Thumbnail Sketches of the Reading Material
Source: Field Work, 2023
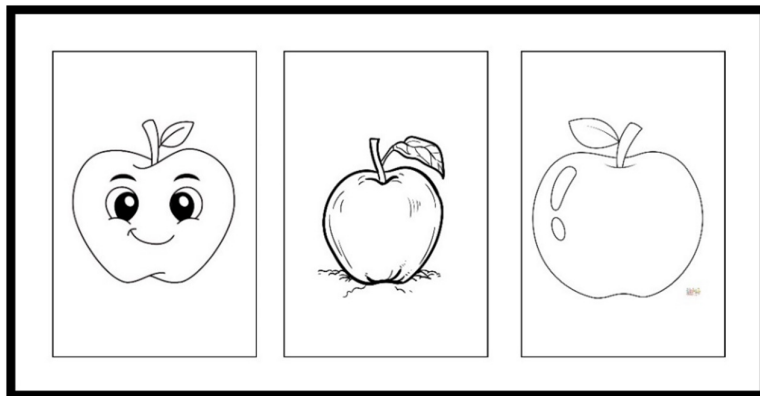
Figure 3: Thumbnail Sketches of the Colouring Book
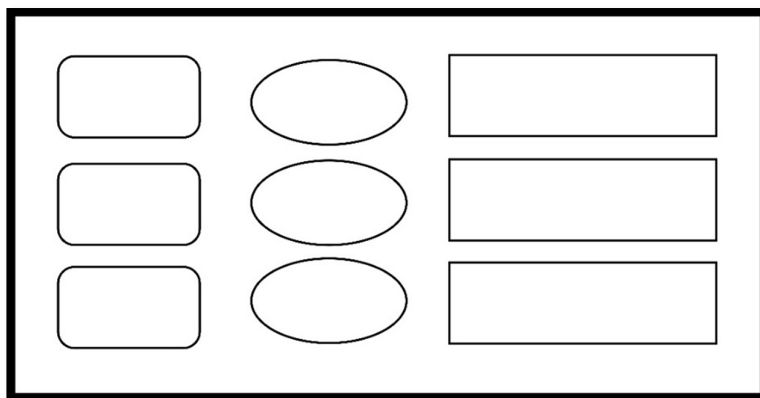
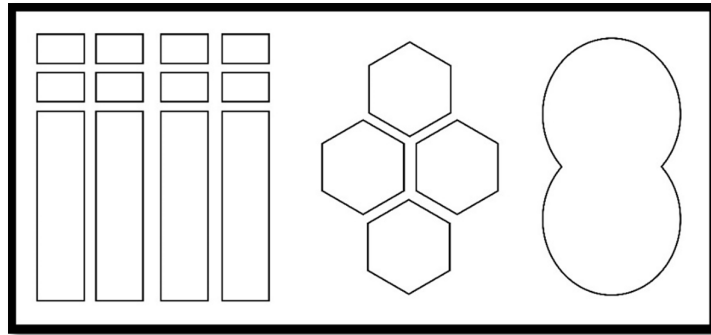*Figure 4: Thumbnail Sketches of the Consonant Vowel Consonant (CVC) Words*

Figure 5: Thumbnail Sketches of Word Game

4.1.2.3. Rough Layout

This marks the subsequent stage in the layout process. During this stage, the researchers integrated text and images into the layout utilizing software applications such as CorelDRAW and Adobe InDesign. Here, in figures 6, 7, 8 and 9, the researchers fine-tuned the final concepts derived from the initial sketches.
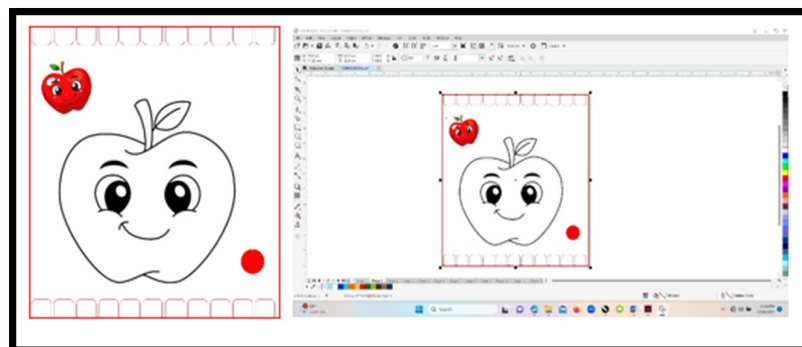

Figure 6: Rough Layout of the Reading Material

Figure 7: Rough Layout of the Colouring Book

Figure 8: Rough Layout of the Consonant Vowel Consonant (CVC) Words
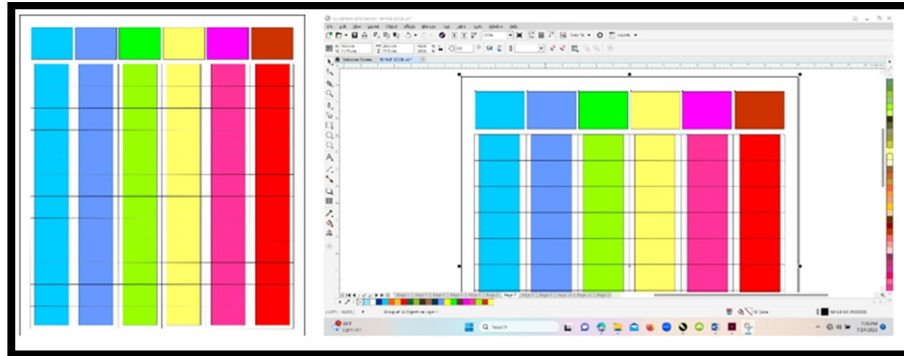

Figure 9: Rough Layout of Word Game

4.1.2.4. Finished or Comprehensive Layout

The comprehensive layout represented the pivotal stage in designing the print product, serving as the master plan or blueprint for the finalized design. During this phase, the researchers implemented necessary changes and ensured that the comprehensive layout contained all the essential information required to complete the print products. Additionally, it depicted the specific colours and fonts employed in the design of the print materials in figures 10 to 30.
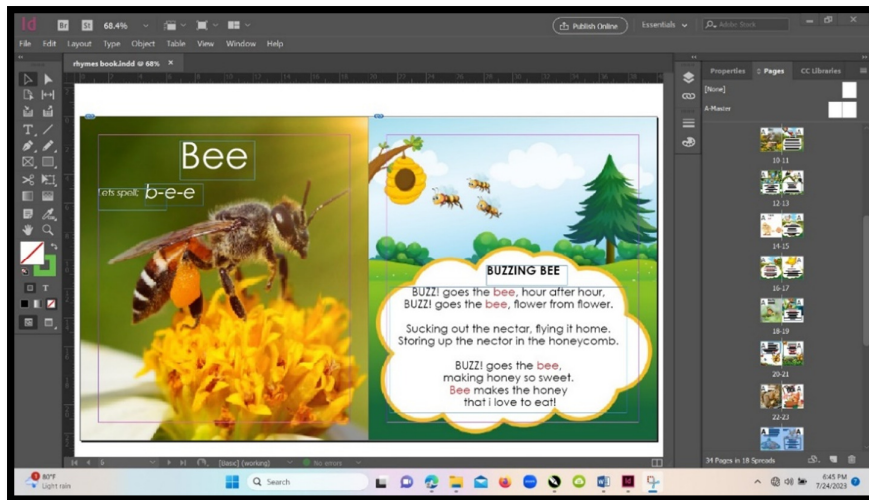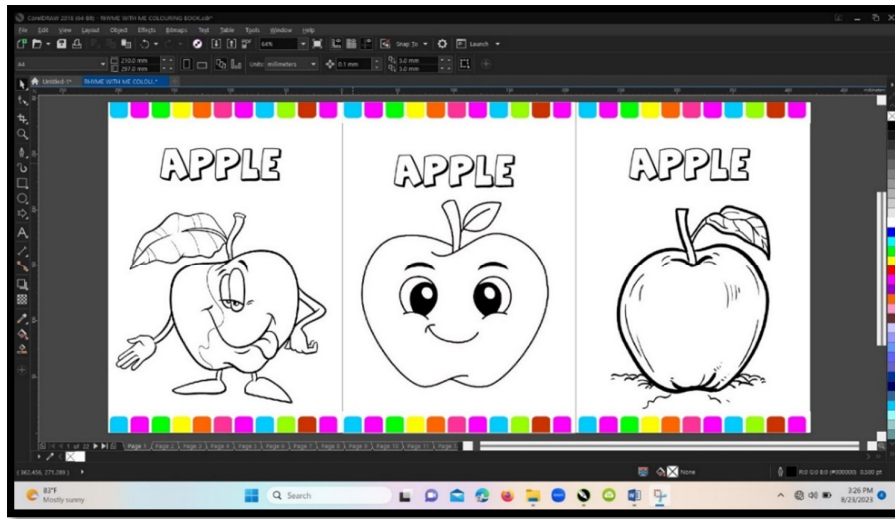

Figure 10: Finished Layout of the Reading Material

Figure 11: Finished Layout of the Coloring Book

Figure 12: Finished Layout of the Consonant Vowel Consonant (CVC) Words 'A' Vowel

Figure 13: Finished Layout of the Consonant Vowel Consonant (CVC) Words 'E' Vowel
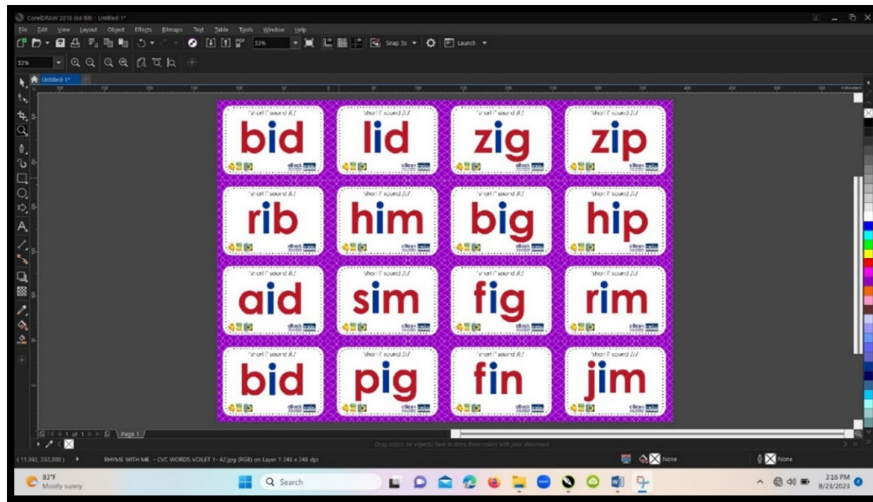
Figure 14: Finished Layout of the Consonant Vowel Consonant (CVC) Words 'I' Vowel

Figure 15: Finished Layout of the Consonant Vowel Consonant (CVC) Words 'O' Vowel

Figure 16: Finish Layout of the Consonant Vowel Consonant (CVC) Words 'U' Vowel
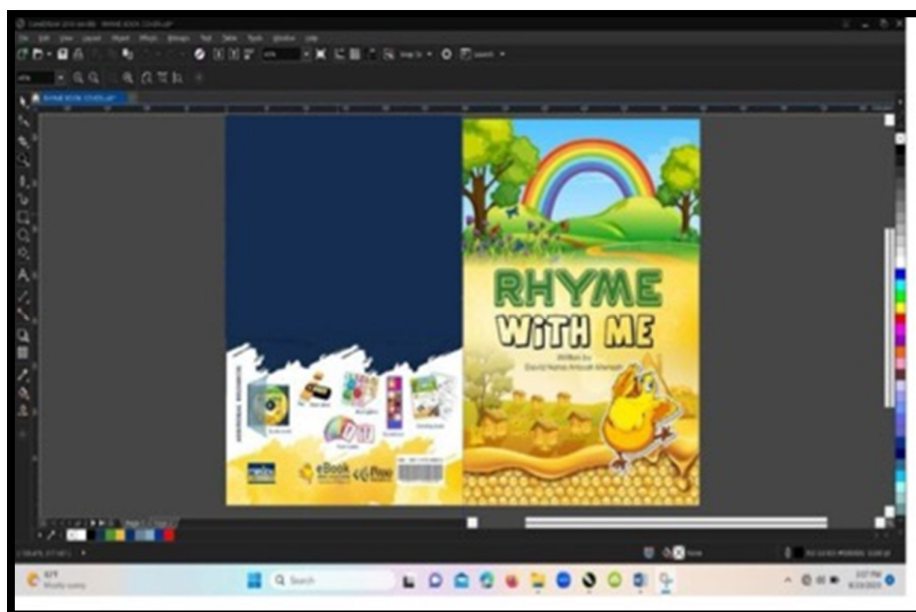
Figure 17: Finished Layout of the Word Game

Figure 18: Finished Layout of the Rhyme Book Cover (Front Page)

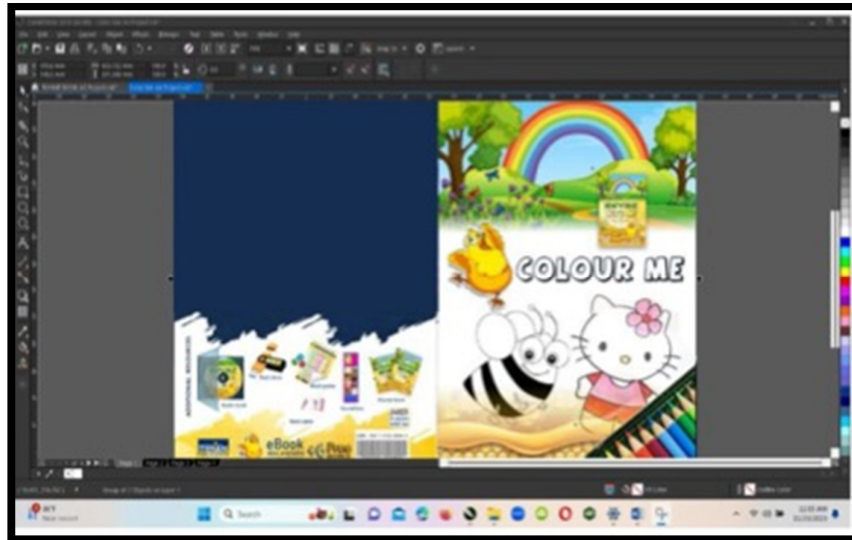*Figure 19: Finished Layout of the Rhyme Book Cover (Back Page)*

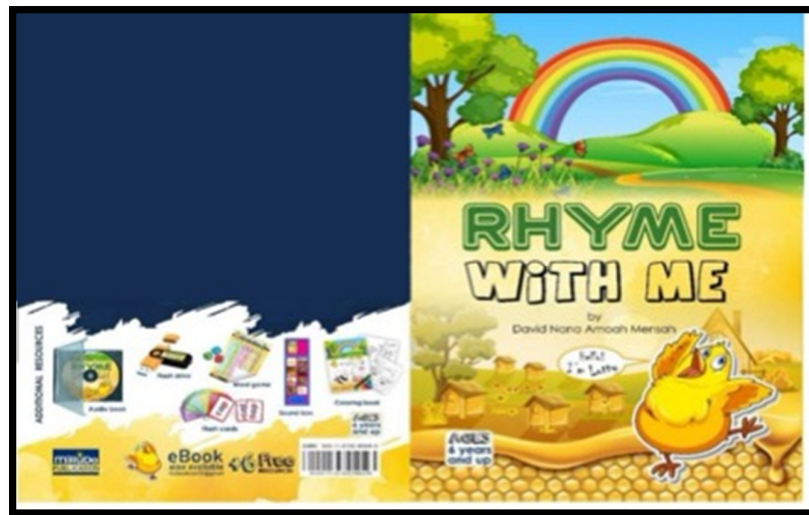*Figure 20: Finished Layout of the Colouring Book Cover (Back Page)*

Figure 21: Finished Cover Design of Rhyme Book

Figure 22: Finished Cover Back Design of Rhyme Book

Figure 23: Finished Cover Design of Colouring Book

Figure 24: Finished Back Cover Design of Colouring Book

Figure 25: Finished Design of Word Game

Figure 26: Finished Design of Consonant Vowel Consonant Words 'A' Vowel

Figure 27: Finished Design of Consonant Vowel Consonant Words 'E' Vowel

Figure 28: Finished Design of Consonant Vowel Consonant Words 'I' Vowels

Figure 29: Finished Design of Consonant Vowel Consonant Words 'O' Vowel

Figure 30: Finished Design of Consonant Vowel Consonant Words 'U' Vowel

4.1.3. Post-Studio Assessment Stage

Pre-testing and evaluation were typically conducted to assess the utility and benefits of reading materials for the intended audience. To facilitate this process, the researchers distributed copies of the completed reading materials to the focus groups and other team members for evaluation and feedback. Incorporating the relevant comments from these reviews, the researchers made necessary modifications to the reading materials prior to publication (Bukhari, 2018).

Subsequently, the reading materials were shared with key stakeholders, including the principal of International Community Montessori School, the headmistress of Twin City Special School, and several other school heads involved in the study. Given their proximity to teachers and students, their endorsement helped disseminate the reading materials effectively. These materials were then distributed to instructors, some parents, and children for further discussion and implementation (O'Connell, 2013).

After one month, feedback indicated a positive and progressive improvement in reading comprehension and facilitation. The majority of children (schoolchildren) demonstrated understanding and retention of the information presented in the resources. According to Miss Stephanie Acquah-Djan (personal communication, February 11, 2023), administrator of the International Community Montessori School, the reading material effectively accommodates each learner's preferred learning style.

Visual learners benefit from clear illustrations, kinesthetic learners engage with tactile sight words, and social learners participate in the provided game. The feedback survey revealed that most schoolchildren and parents appreciated the inclusion of games, making the reading material enjoyable and engaging (Frimpong, 2021).

5. Conclusions

The research conducted on enhancing reading comprehension through visual documentation approaches for children with reading difficulties and disabilities has yielded valuable insights into the effectiveness of these interventions. It was evident from the study that visual aids such as reading materials for schoolchildren have proven to be highly effective in improving reading comprehension among children who struggle with reading challenges and disabilities. These techniques provided alternative pathways for understanding that cater to different learning preferences and cognitive abilities. One of the key benefits of visual aids is that they help children organize and structure information in a more accessible way. Graphic reading materials, for example, allowed schoolchildren to visually represent the

relationships between different ideas and concepts. Schoolchildren better comprehended and retained information by visually mapping out the main ideas, supporting details, and connections. This visual representation helped them see the bigger picture and understand how different elements fit together, ultimately enhancing their reading comprehension.

It was also revealed that visual documentation techniques become more engaging and interactive for the audience. This approach allowed for a more holistic understanding of the information being presented, as different modalities cater to different learning styles. For example, visual learners benefited from diagrams and infographics. The use of multiple modalities with text and images helped reinforce key concepts and information, as repetition through different mediums aided in memory retention. These approaches were particularly useful in educational settings, where complex topics were broken down and explained in various ways to cater to a diverse range of learners. The incorporation of multimodal components in visual documentation techniques not only enhanced the effectiveness of communication but also provided a more immersive and engaging experience for the audience. This approach led to a deeper understanding of the content being presented and ultimately improved the overall learning experience.

6. Implication for Further Research
Future research in the domain of enhancing reading comprehension through visual documentation approaches for children with reading difficulties and disabilities should consider several avenues for exploration:

- Despite the promising findings, there remains a need for further research to address gaps in the literature. Future studies could focus on comparing the efficacy of different types of visual documentation approaches, exploring the long-term effects of these interventions, and investigating the optimal ways to individualize interventions based on students' specific needs and preferences.
- Conducting comparative studies to evaluate the relative effectiveness of different types of visual documentation approaches (e.g., graphic organizers, visual schedules, multimedia aids) in improving reading comprehension for children with diverse reading difficulties and disabilities. Such studies can help identify the most efficient and adaptable strategies for various learner profiles.
- Investigating the efficacy of individualized visual documentation approaches tailored to specific needs and learning styles of children with reading difficulties and disabilities. This could involve personalized interventions that take into account factors such as cognitive abilities, sensory preferences, and specific reading challenges.
- Exploring the integration of emerging technologies (e.g., augmented reality, virtual reality) into visual documentation approaches to enhance engagement and effectiveness, particularly for tech-savvy younger generations.

7. Conflict of Interest
The authors declare no conflict of interest.

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