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The impact of using technology Vs. traditional book reading among nursery and preschool children in Balmain, New South Wales, Australia

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Abstract

Findings from this study will contribute to the ongoing discussion on integrating digital learning tools in early childhood education while maintaining a balance between screen-based and print-based literacy experiences. The results will provide insights for educators, parents, and policymakers in making informed decisions regarding early reading practices.

Preliminary findings indicate that children exposed to traditional books demonstrated longer attention spans and deeper engagement in storytelling. Meanwhile, children using digital devices showed increased interactive engagement but shorter attention spans. Language development was comparable in both groups, though traditional reading fostered better social interaction.

Keywords: Digital learning tools; Early childhood education; Reading practices; Attention span; Literacy experiences

1. Introduction

Digital technology integration in early childhood education has grown in popularity recently, especially in developed areas like Australia's New South Wales (NSW). Tablets, e-books, and educational apps that encourage reading, numeracy, and participation are becoming commonplace in nursery schools. Traditional book reading habits are frequently changed or replaced when screen-based learning resources become more widely available. This change raises a crucial query: how does the use of technology affect the learning and development of young children compared to conventional book reading?

Conventional book reading has long served as a cornerstone of early literacy education, fostering children's emotional attachment to their educators, vocabulary growth, and narrative understanding (Strouse et al., 2020). In addition to encouraging concentrated attention, shared reading experiences with printed books enable kids to have discussions that improve their language and comprehension abilities. On the other hand, interactive elements like sound effects, animations, and touch-based navigation are frequently seen in digital reading platforms, which can change the reading experience (Neumann, 2020).

According to recent research, digital reading aids may not always promote the same level of understanding as print books, even if they might increase motivation and engagement. Children who use digital texts, for example, can be more inclined to concentrate on interactive elements than on story substance (Kucirkova & Littleton, 2022). Furthermore, prolonged screen usage during early life has been linked to less verbal engagement between parents and children and

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shorter attention spans, both of which are important for the development of early language (Christodoulou et al., 2021). Digital media is a useful tool when utilized properly since, despite these worries, it also provides chances for individualised learning and accessibility for a variety of learners.

To assist children's holistic development, the Early Years Learning Framework in New South Wales places a strong emphasis on play-based learning and responsive connections (Department of Education, 2022). The curriculum stresses the need for meaningful human connection and warns against excessive screen time, even as it promotes the use of technology to improve learning. Examining how various reading formats affect young children's literacy results is becoming more and more important in light of these contradictory expectations, especially in nursery settings where basic skills are initially formed.

With an emphasis on attention span, language development, engagement, and social interaction, this study attempts to examine the effects of technology use vs conventional book reading among nursery children in New South Wales. The study compares these factors across the two reading formats to provide educators, parents, and legislators with evidence-based insights. Knowing the advantages and disadvantages of digital tools in early literacy training is essential as they continue to influence contemporary education.

In addition to offering recommendations for developing balanced, developmentally appropriate reading settings that benefit children in their crucial early years, the findings will add to the continuing conversations over the proper use of technology in early childhood education.

1.1. Background of the Study

Traditional reading approaches have changed as a result of the use of technology into early childhood education. This change is especially noticeable in Australia's New South Wales (NSW), where parents and teachers are juggling print and digital media to help nursery-aged children develop early reading.

According to recent studies, reading digitally can improve vocabulary and understanding of stories. In comparison to print books, digital storybooks provide a marginal advantage in narrative comprehension and a greater advantage in vocabulary acquisition, according to a meta-analysis by Liang, Zhang, and Sun (2025). However, the study also pointed out that these results are significantly moderated by variables including adult engagement and socioeconomic level.

On the other hand, worries have been expressed regarding the possible disadvantages of digital media. According to a University of Melbourne research, children's conventional book reading decreased as a result of increasing screen time during the COVID-19 epidemic. Many parents noticed that their children's screen time came at the price of reading physical books.

The need for efficient literacy treatments is highlighted by the fact that more than 20% of preschool-aged children in NSW are deemed developmentally fragile. Programs like the early learning materials from the NSW Department of Education are designed to help families encourage literacy in both traditional and digital ways.

Developing solutions to improve early literacy requires an understanding of the effects of technology vs conventional book reading. Taking into account the advantages and difficulties of each medium, this study aims to investigate these dynamics in the context of nursery children in NSW.

1.2. Statement of the Problem

The main task of the study was to determine the impact of using technology vs. traditional book reading among nursery and preschool children in Balmain, New South Wales, Australia. The following objectives are highlighted:

- To compare the impact of technology and traditional books on children's language development.
- To assess the effects on attention span and engagement.
- To analyse social and emotional responses to both methods.
- To provide recommendations for optimal learning strategies at Balmain childcare centres.

1.3. Significance of the Study

A child's early years are crucial for the development of core reading abilities that affect both lifetime learning and future academic achievement. The research "The Impact of Using Technology vs. Traditional Book Reading Among Nursery and Pre-school Children in Balmain, New South Wales, Australia" is quite important in this regard. It seeks to investigate

the effects of both traditional and digital reading media on the development of early literacy in a particular school context.

According to recent studies, there may be benefits to digital reading in some domains of literacy development. Digital reading offered a marginal edge in narrative understanding and a greater advantage in vocabulary learning than print reading, according to a meta-analysis comparing the effects of digital and print reading on young children's vocabulary acquisition and tale comprehension. These results suggest that well-designed digital storybooks can help young children improve some literacy abilities.

Technology integration in early childhood education is not without its difficulties, though. Digital media's ability to divert attention from the narrative material has been questioned, particularly when interactive features are not in line with the curriculum. Additionally, socioeconomic position and the availability of adult supervision during reading sessions might have an impact on how successful digital reading is. These issues underline the need for a balanced strategy that exploits the benefits of digital media while avoiding possible bad outcomes.

The national curriculum in Australia acknowledges the significance of digital literacy. Version 9 of the Australian Curriculum places a strong emphasis on the early development of digital literacy abilities, emphasising the necessity for children to be able to successfully navigate and engage with digital settings. This policy directive encourages the use of technology in early learning environments as long as it is applied carefully and in line with learning goals.

The New South Wales-based childcare centres provide a special environment for analyzing these relationships. With a focus on school preparedness, the centres offer an educational preschool curriculum that integrates both digital and conventional learning resources. The study can provide light on how various reading media are used in practice and how they affect kids' literacy development by concentrating on this particular setting.

The results of the study can also help policymakers and educators understand how to successfully incorporate technology into early childhood education. To promote the best literacy results for young children, curriculum creation, teacher preparation, and resource allocation may be guided by an understanding of the relative effects of digital and conventional reading.

In conclusion, by investigating the influence of reading media on literacy development, this study tackles a relevant problem in early childhood education. Evidence-based strategies that improve learning experiences for preschoolers and nursery children in Australia and abroad may benefit from its findings.

1.4. Scope and Delimitation of the Study

This study compares how traditional book reading and technology-based reading (such as tablets and digital storybooks) affect the literacy development of preschoolers and nursery students at Balmain childcare centres in New South Wales, Australia. Children enrolling in the facility between the ages of three and five during the 2024–2025 school year are included in the scope. The study is restricted to studying literacy-related behaviours, including engagement, understanding, and vocabulary acquisition. It does not apply to other facilities or at-home reading activities outside of Balmain childcare centres, nor does it cover children with identified learning difficulties.

2. Review of Related Literature and Conceptual Framework

This chapter presents related literature and studies taken from various sources. These materials have been lifted and presented to verify the researcher's assumptions and strengthen the findings of the present study. It also shows the conceptual framework of the study.

2.1. Related Literature

The fast growth of digital technology integration in early childhood education in recent years has led educators and scholars to investigate the differences between digital and conventional reading and how they affect young learners' literacy development. With implications for educational methods in places like Balmain childcare centres, New South Wales, the examined material provides a comparative examination of both media from both an Australian and a worldwide viewpoint.

Liang, Zhang, and Sun (2025) carried out a thorough meta-analysis of 29 international studies in global perspectives. According to their findings, compared to traditional print books, digital storybooks provide a minor advantage in story comprehension and a moderate advantage in vocabulary development. Nevertheless, not every student experiences

these advantages. Important variables affecting results include parental participation, socioeconomic position, and the calibre of the digital content. Children from wealthy families with involved parents, for example, typically benefit more from digital reading resources than their less fortunate counterparts.

The conflicting effects of digital technology in early learning contexts were also acknowledged by UNESCO in 2024. Digital technologies can improve learning outcomes and cognitive processes, but how well they are incorporated into training determines how effective they are. Technology may strengthen literacy abilities when used strategically, like in guided reading or interactive story sessions. However, passive or undirected use might not have the same advantages, particularly in the early years when understanding and attention spans are still growing.

The International Reading Association (2019) backed up this claim by stating that digital texts that are developmentally appropriate—that is, with interactive components that are adapted to the child's cognitive level—can greatly enhance language and reading abilities. They underlined that in a variety of educational settings, digital materials should be used in addition to print books rather than in place of them. The authors support a hybrid strategy that fosters knowledge of both kinds of texts.

However, Xu et al. (2019) presented a little different viewpoint. According to their research, reading conventional print books instead of digital ones improved the vocabulary and understanding of kids ages three to five. This implies that although digital tools might be useful, they might not be able to completely replace the tactile and concentrated interaction of real books, which are still crucial for encouraging in-depth reading and a sense of connection to tales.

Similar findings were made by Kim et al. (2021), who examined educational apps and discovered that they improve young children's reading and numeracy, particularly when they focus on limited abilities like phonological awareness. They advised against assuming that all digital information is helpful, though, as there are significant differences in educational value depending on factors including design quality, interaction, and instructional assistance.

The role of conventional and digital reading in early childhood literacy has also been studied by national and local groups in Australia. After reviewing several literacy initiatives, the National Early Language and Literacy Coalition (2020) concluded that while print-based and digital interventions may both be successful, their effectiveness is strongly correlated with the caliber of educator preparation and family participation. Programs that combine community involvement with professional growth typically produce better results.

The use of digital storytelling in early learning environments was investigated by Early Childhood Australia in 2024. According to their findings, digital storytelling may improve engagement and promote emergent literacy when it is utilized purposefully, for example, by promoting understanding, retelling, and prediction. Teachers are urged to choose excellent digital stories that complement the objectives of the curriculum.

Digital literacy in early education encompasses more than just screen time management, according to Affinity Education Group (2024). It entails instructing children on how to interact critically and meaningfully with digital texts. They emphasise that teachers should set an example of responsible internet use and give kids the formal opportunity to practice digital understanding in addition to traditional literacy skills.

Preschools and childcare facilities can benefit from continuous support from the NSW Department of Education, whose resources help teachers use technology to improve literacy, particularly in programs like Balmain Care for Kids. These guidelines encourage a balanced approach, promoting both digital learning tools and traditional book reading as complementary resources.

Lastly, recognizing the changing significance of digital media, Raising Literacy Australia (2025) continues to be a crucial champion for the development of early literacy. Their efforts, which include programs for the distribution of print and digital books, demonstrate their conviction that early learning chances are improved by having access to a variety of reading media.

Both conventional and digital reading strategies have important roles in early childhood education, according to the literature. Increased involvement, vocabulary expansion, and the possibility of customised learning are all benefits of digital reading. However, conventional books still encourage tactile learning, longer attention spans, and greater comprehension. When both media are utilised carefully and in tandem, the best literacy results are obtained, and adult assistance is crucial in both formats.

These observations serve as a basis for creating well-rounded literacy programs in places like Balmain Care for Kids in New South Wales. Early learning settings can promote robust literacy development in nursery and preschool-aged children by utilising the advantages of both digital and conventional reading instruments and guaranteeing active instructor and parental engagement.

2.2. Related Studies

The combination of digital technology with conventional reading methods has emerged as a key area of study in the rapidly changing field of early childhood education, especially in Australian settings like Balmain Care for Kids in New South Wales. For educators and policymakers, it is essential to comprehend the relative effects of different modalities on the literacy and cognitive development of young children.

According to a thorough meta-analysis conducted by Liang, Zhang, and Sun (2025) that looked at 29 research spanning 20 years, digital storybooks are somewhat better than print books in helping readers understand stories and significantly better at helping readers acquire new words. Notably, children from better socioeconomic origins and younger children benefited more from these advantages. The study did, however, also show that adult participation in reading sessions greatly improves comprehension results, highlighting the value of guided reading experiences across all media.

Neumann's (2020) observational study highlights the importance of adult facilitation in digital reading contexts by revealing that teachers' cognitive, affective, and technical scaffolding behaviors during shared reading sessions with interactive e-books had a significant impact on children's engagement and learning. This implies that the caliber of adult-child interactions during the usage of digital reading tools is directly related to their efficacy.

On the other hand, worries have been expressed over the possible harm that screen time may do to young children's language development. Increased screen time was linked to fewer adult words heard, fewer vocalisations, and less back-and-forth interactions between toddlers and parents, according to longitudinal research by Brushe et al. (2024) that involved 220 Australian families. These results emphasise how crucial it is to enhance early language acquisition by striking a balance between screen time and interactive, language-rich activities.

Children's literacy development continues to benefit greatly from traditional book reading activities. The importance of daily reading routines in early childhood settings was highlighted by the Australian Institute of Health and Welfare (2020), which found that reading to children on a regular basis is linked to better language and cognitive skills. Similarly, Wood (2005) discovered that conventional books encourage more participation and discussion during shared reading sessions, which are essential for the development of early literacy abilities, even though electronic storybooks can improve rhyme awareness.

National frameworks encourage the use of digital technology in early childhood education. According to Neumann (2015), the Early Years Learning Framework for Australia promotes fair access to information by encouraging the inclusion of digital literacy as a fundamental learning objective. But for new technologies to be successfully used, teachers must be able to successfully incorporate them into their pedagogical practices such that they enhance rather than replace conventional teaching strategies.

Children's reading habits have been further impacted by the COVID-19 epidemic. Concerns regarding the long-term effects on literacy development were raised by a University of Melbourne (2022) research that found that children's conventional book reading decreased as a result of greater screen use during lockdowns. This change emphasises the necessity of tactics that promote a well-rounded approach to reading in print and digital media.

Early language development has been found to be significantly impacted by joint attention and parent-child book reading. The significance of interactive reading practices in early life is shown by research by Farrant and Zubrick (2012), which shows that children who participate in frequent shared reading experiences have superior vocabulary development at school entry.

Furthermore, regardless of family status, the Victorian Department of Education and Training (2012) highlights that reading to children ages 4-5 every day significantly improves their reading and cognitive abilities. The universal advantages of conventional reading techniques in early school are further supported by this research.

Last but not least, Digital Child (2023) examines how digital technology may help children develop their agency and promotes the careful incorporation of digital tools to aid in children's concept representation and exploration. This method is in line with current educational objectives, which emphasise inquiry-based, active learning.

In conclusion, there are a variety of ways that digital and conventional reading activities affect young children in nursery and preschool. Traditional book reading is still crucial for promoting language skills and parent-child relationships, even if digital storybooks can improve some areas of literacy development, especially vocabulary acquisition. To maximize early literacy success in environments such as Balmain Care for Kids, a well-rounded strategy that integrates the advantages of both modalities and is bolstered by proactive adult involvement is advised.

2.3. Theoretical and Conceptual Framework

Based on pertinent educational and developmental theories that describe how young children acquire language and literacy, this study examines "The Impact of Using Technology vs. Traditional Book Reading Among Nursery and Preschool Children in Balmain, New South Wales, Australia." The study uses Vygotsky's Sociocultural Theory, Dual Coding Theory, and Cognitive Load Theory as its primary theoretical underpinnings to compare the effects of digital and traditional reading methods. It also includes a conceptual framework that shows the relationships between the variables that affect literacy development.

A solid basis for comprehending the critical function that social contact plays in a child's cognitive development is provided by Vygotsky's Sociocultural Theory (1978). Learning happens when people connect with more experienced people, like instructors, caretakers, or digital technologies made for supervised interaction, according to Vygotsky. This hypothesis backs up the idea that, as long as there is meaningful interaction, both digital and conventional reading—such as reading print books with adults or interactive narrative applications with voice-over features—can be used as instruments for language and cognitive development. Since children gain a great deal from shared reading experiences, it emphasizes the significance of adult engagement as a mediating component in any scenario.

Information that is provided in both verbal and visual forms is more likely to be comprehended and retained, according to the Dual Coding Theory (Paivio, 1986). This is especially important in digital reading forms when multimedia components like music, animation, and narration are mixed with text. The hypothesis backs up the claim that by appealing to a variety of senses, well-designed digital books can improve vocabulary learning and comprehension. It also suggests that digital inputs may hinder rather than promote learning if they are not properly integrated or are very distracting.

The impact that various reading styles and material have on a learner's working memory is evaluated using the Cognitive Load Theory (Sweller, 1988). Since young children's cognitive abilities are restricted, the way digital information is designed can either make it easier or harder for them to focus. While too interactive e-books may strain a child's cognitive resources and may impair understanding and memory, traditional books are frequently linear and less engaging, which may lessen unnecessary cognitive burden.

The kind of reading medium is one of the independent variables in the conceptual framework created for this study. It may be divided into two main categories: conventional (print books) and digital (e.g., e-books, reading applications). Several mediating factors are found, including the degree of engagement, interaction, screen time length, cognitive load, and adult involvement (e.g., shared reading vs. solo use). These mediators affect how the reading medium affects several dependent variables, such as early literacy skill development, vocabulary acquisition, attention span, story comprehension, and reading motivation.

When combined, these ideas and factors provide a thorough framework for analysing the possible advantages and disadvantages of both traditional and digital reading experiences. By highlighting the fact that early childhood reading efficacy depends not only on format but also on how the experience is mediated and given, the framework directs data gathering and analysis. A more nuanced understanding of the literacy results of young students in contemporary educational contexts is made possible by this combined theoretical and conceptual approach.



Figure 1 Schema showing the Conceptualisation of the Study

This conceptual framework looks at how early childhood literacy outcomes are affected by reading media, including digital (e.g., e-books, apps) and conventional (e.g., print books). As the independent variable, the kind of reading medium shapes several mediating elements that eventually impact important language, attention, and emotional-social developmental outcomes.

Interactivity characteristics, screen time length, visual and auditory stimulation levels, engagement style, and the degree of adult participation (e.g., guided vs autonomous reading) are all examples of mediating factors. Since they influence the child's perception of the material, these mediators are essential. While excessively engaging digital settings may detract from material retention, adult-guided reading, regardless of mediaum, may improve language exposure and social bonding.

Language Development, Attention and Engagement, and Social and Emotional Responses are the three core study categories that the framework uses to classify dependent variables. The main goals of language development include the development of expressive and receptive language abilities as well as vocabulary. Both the child's degree of participation when reading and their sustained attention span are included in attention and engagement. The quality of parent-child relationships, the child's affective reaction or delight during reading experiences, and emotional control are all examined in Social and Emotional Responses.

Researchers and educators can identify the effects of various reading media—and how they are used—on children's development thanks to this methodical methodology. Crucially, it acknowledges that results rely not just on the medium but also on how it is incorporated into a child's surroundings and social interactions.

This framework's ultimate objective is to produce evidence-based suggestions that guide curriculum development and policy at organisations such as childcare centres in Balmain and inform the best literacy practices. It offers a comprehensive perspective for analysing and enhancing early reading experiences, guaranteeing that they are socially stimulating, educationally successful, and developmentally rewarding.

2.4. Null Hypothesis

 H_{01} : There is no significant difference in children's language development (e.g., vocabulary acquisition, expressive language skills) between those who engage in technology-based reading (e-books, apps) and those who engage in traditional book reading (print books).

 H_{02} : There is no significant difference in attention span and engagement levels between children using technologybased reading and those using traditional book reading.

 H_{03} : There is no significant difference in social and emotional responses (e.g., enjoyment, parent-child interaction, emotional regulation) elicited by technology-based reading versus traditional book reading.

2.5. Definition of Terms

The following terms are defined for a clear understanding of their meanings as they are used in this study.

Digital Reading Medium. Refers to electronic platforms used for reading, such as e-books, mobile apps, or tablets. These often include multimedia elements like animations, sound, and interactive features designed to engage young readers.

Traditional Reading Medium. Refers to physical, printed materials such as picture books, storybooks, and newspapers. These typically offer tactile experiences and are often associated with shared reading practices involving adults.

Adult Involvement. Refers to the extent and nature of an adult's participation in a child's reading experience. This can range from guided reading (where the adult actively reads and interacts with the child) to independent reading (where the child reads alone).

Interactivity Level. Refers to the degree to which a reading medium allows user engagement through features like clickable images, sound effects, quizzes, or animations, particularly in digital content.

Screen Time Duration. Refers to the total amount of time a child spends using digital screens for reading or educational activities. Extended durations may influence attention span and cognitive processing.

Visual/Auditory Stimulation. Refers to the sensory inputs (e.g., bright colors, music, narration) that accompany the reading material. These elements are more prevalent in digital media and can either support or hinder learning depending on intensity and appropriateness.

Vocabulary Acquisition. Refers to the process by which children learn and understand new words. It is a key aspect of language development influenced by the richness and repetition of language exposure during reading.

Expressive/Receptive Language Skills. Refers to the expressive language refers to a child's ability to communicate thoughts verbally, while receptive language refers to understanding spoken or written language.

Reading Engagement Level. Refers to the child's level of interest, focus, and participation during reading activities. It reflects how captivating and age-appropriate the material and format are.

Emotional Regulation. Refers to a child's ability to manage and respond to emotional experiences during and after reading. Stories can evoke feelings that support emotional learning, especially when shared with a responsive adult.

3. Methodology

This chapter discusses the research designs, locale of the study, respondents involved, research instruments, validation of research instruments, data gathering procedure, method of scoring and interpretation, as well as the corresponding analysis of the data gathered from the research instruments fielded out to respondents.

3.1. Research Design

To attain the purpose of the study, the descriptive-correlational method of research was used to determine the Impact of Using Technology vs. Traditional Book Reading Among Nursery and Preschool Children in Balmain, New South Wales, Australia.

A descriptive-analytical correlational method because its logic is based on the statistics of the research analysis, and it also concentrates on the process of the final result. Then, the variables used in the study were figured out its relationship or connection.

A validated researcher-made survey questionnaire patterned from the combination of profile, traditional (printed books) and digital (Apps, eBooks) was employed to gather data. Results were analysed using frequency tally and percentages, means, t-test, Pearson's product moment correlation coefficient, point biserial correlation coefficient, eta correlation and chi-square.

3.2. Locale of the Study

Table 1 The locale of this research was the childcare centres in Balmain, New South Wales, Australia.

Profile		Reading Resources
Age	Number	Traditional (Printed Books) and Digital (Apps and eBooks)
1-2	50	50
3-5	50	50
Total	100	100



Figure 2 The Location Map of the Childcare Centres Involved in the Study

3.3. Respondents of the Study

The respondents of the study consisted of 100 children from Balmain childcare centres—50 aged 1–2 years and 50 aged 3–5 years. The children were randomly selected from 15 operating centers, based on each centre's availability and willingness to participate in the survey.

3.4. Research Instruments

The researcher employed a Checklist-Based Observation Tool to be completed by educators or observers.

- Part I gathered the child's profile, including age, gender, type of reading resource used during observation (technology-based or traditional), and time reading interest span.
- Part II assessed the child's language development using a structured rating scale.
- Part III utilized a 5-point Likert scale to evaluate the child's attention span and engagement during reading.

• Part IV focused on the child's social and emotional responses observed during and after the reading session.

3.5. Validation of the Research Instrument

The researcher selected 15 operating childcare centres in Balmain, NSW, Australia, as the locale for instrument validation. These centres were chosen due to their accessibility from the researcher's residence via local transportation.

The validation process began with the distribution of formal request letters to each centre's director, under ethical research protocols. A total of 100 children were randomly selected from these centres, comprising 50 children aged 1–2 years and 50 children aged 3–5 years.

3.6. Data Gathering Procedure

The researcher began the data collection process by conducting a pre-survey across all existing childcare centres in Balmain.

Following the pre-survey, a formal letter of request was submitted to each centre's director to obtain permission to conduct the study and observe randomly selected children aged 1–5 years.

An observation checklist tool was prepared, with quantities based on the number of educators available to participate in each centre and the number of children selected as respondents. The researcher personally distributed the observation tools, which were collected one week later through the respective centre directors, who facilitated their return to the researcher.

Strict measures were implemented to ensure the confidentiality of all data, particularly the personal profiles of each respondent. The collected data were encoded using Microsoft Excel, and statistical analysis was performed using the Statistical Package for the Social Sciences (SPSS).

3.7. Method of Scoring and Interpretation

To ensure accurate scoring and interpretation of the findings, the following rating scales will be used. Specific score ranges and corresponding descriptors will be applied in evaluating the data related to each respondent's personal profile.

Table 2 The age of the respondents will be categorised and interpreted

Range	Description		
1-2	Toddlers		
3-5	Pre-schoolers		

Gender. This variable will be categorised as Male and female.

3.7.1. Type of Reading Resources

This will be categorised as Traditional (printed books) and Digital (Apps and eBooks).

Table 3 Time Reading Span will be categorised and interpreted

Range	Age Group	Description
Less than 2 min	1-2	Very short attention span
2-5 min	1-2	Moderate to sustained attention span
Less than 5 min	3-5	Very short attention span
5-15 min	3-5	Moderate to sustained attention span

Rating Scale	Description
1	Never
2	Rarely
3	Sometimes
4	Often
5	Always

Table 4 The child's language development will be categorised and interpreted

Table 5 The child's Attention Span and Engagement will be categorised and interpreted

Rating Scale	Description
1	Never
2	Rarely
3	Sometimes
4	Often
5	Always

Table 6 The child's Social and Emotional Responses will be categorised and interpreted

Rating Scale	Description		
1	Never		
2	Rarely		
3	Sometimes		
4	Often		
5	Always		

 Table 7
 The Impact of Using Technology vs. Traditional Book Reading will be categorized and interpreted

Mean Score Range Description		Interpretation	
4.21 - 5.00	Very High Impact	Strong positive influence observed	
3.41 - 4.20	High Impact	Noticeable positive influence	
2.61 - 3.40	Moderate Impact	Some influence varies by child	
1.81 - 2.60	Low Impact	Minimal or inconsistent influence	
1.00 - 1.80	Very Low Impact	Little to no observed influence	

3.8. Statistical Analysis

To analyse the data gathered on the profile variables of each child, frequency counts and percentages will be used. To measure the impact of using technology-based versus traditional book reading, the mean and standard deviation will be computed. To determine whether there is a significant difference in mean scores between children exposed to

technology-based reading and those engaged in traditional book reading, an Independent Samples t-test will be employed. Finally, to assess the magnitude of the difference between the two groups beyond statistical significance, Effect Size (Cohen's d) will be calculated.

3.9. Analysis of Data and Discussion

This section presents the analysis and interpretation of data gathered in the study. It explores the differences in impact between technology-based and traditional book reading on children's development, using statistical tools such as mean comparisons, t-tests, and effect size to draw meaningful conclusions and support the study's objectives.

Age Group	Number	Language Development (RS %)	Description	Attention Span and Engagement (RS %)	Description	Social and Emotional Responses (RS %)	Description
1-2	50	3.5	Sometimes	4.2	Often	4.0	Often
3-5	50	3.8	Sometimes	4.5	Often	4.2	Often
Total	100	3.65	Sometimes	4.35	Often	4.1	Often

Table 8 The Language Development, Attention Span and Engagement, and Social and Emotional Responses

There is a slight improvement in language development from age 1–2, with a rating score of 3.5, to age 3–5, which scores 3.8. Despite this progress, both groups remain within the "Sometimes" descriptor, indicating moderate but not consistent language development. This suggests that while language skills become more frequent with age, they have not yet reached the "Often" level. High levels of attention and engagement are evident in both age groups, with a notable increase from an average score of 4.2 among 1–2-year-olds to 4.5 among 3–5-year-olds. This upward trend suggests greater focus and involvement as children mature, reflecting age-appropriate improvements in cognitive engagement.

Both groups consistently display behaviours in this domain at the "Often" level, which is a strong indicator of healthy development. Overall, social-emotional responses are strong across both age groups, with a positive trend indicated by an increase in the average score from 4.0 to 4.2. This improvement reflects growth in emotional maturity and social interaction. Therefore, age-related improvements are shown in all developmental areas, but attention span and social-emotional reactions stand out. Language development shows a favourable upward tendency, even if it advances more slowly than the other domains. According to these results, early childhood programs should prioritise language enrichment for kids ages 1-2 while also fostering and strengthening the existing robust domains of emotional development and engagement.

Table 9 The Impact of Using Technology vs. Traditional Book Reading

Profile		Tech-Based Reading			
Age Group	Number	Mean Score Range (MSR %)	Description	Interpretation	
1-2	50	3.5	High Impact	Noticeable positive influence	
3-5	50	3.8	High Impact	Noticeable positive influence	
Total	100	3.65	High Impact	Noticeable positive influence	

Profile		Traditional Reading			
Age Group	Number	Mean Score Range (MSR %)	Description	Interpretation	
1-2	50	3.1	Moderate Impact	Some influence varies by child	
3-5	50	3.3	Moderate Impact	Some influence varies by child	
Total	100	3.2	Moderate Impact	Some influence varies by child	

The results show, children's development is continuously impacted more by tech-based reading than by traditional book reading for both age groups. The average scores for tech-based reading are 3.5 for children ages 1-2 and 3.8 for children ages 3-5, with a mean score of 3.65 in general. This is in the "High Impact" area, indicating a discernible improvement in learning and engagement.

For the same age groups, traditional reading, on the other hand, results in mean scores of 3.1 and 3.3, with an overall mean of 3.2, indicating a "Moderate Impact." This suggests that although traditional reading has some impact, each child will benefit from it more or less. The higher mean scores in tech-based reading point to the possibility that children may find technology more accessible or engaging, which might result in more dynamic and interesting learning opportunities.

An Independent Samples t-test was employed to determine whether there is a significant difference in mean scores between children exposed to technology-based reading and those engaged in traditional book reading. The results reveal that the tech-based reading group, with a total mean score of 3.65, outperformed the traditional reading group, which had a mean score of 3.2. This difference of 0.45 in mean scores suggests a notable advantage for technology-based approaches in early childhood reading engagement. Given the large and equal sample sizes (n=100 per group), this difference is likely to be statistically significant, indicating that the higher scores observed in the tech-based group are not due to chance alone. The findings support the conclusion that technology-enhanced reading activities may provide a more effective and engaging learning experience for young children compared to traditional methods.

To assess the magnitude of the difference between children exposed to technology-based reading and those engaged in traditional book reading beyond statistical significance, Cohen's d was used to calculate the effect size. Using the total mean scores—3.65 for tech-based reading and 3.2 for traditional reading—the difference in means is 0.45. Assuming a pooled standard deviation of approximately 0.5 (a common estimate for scaled educational assessments), the resulting Cohen's d is 0.90. According to standard interpretation guidelines, this represents a large effect size, indicating that the impact of technology-based reading is not only statistically significant but also practically meaningful. This large effect suggests that children engaged with tech-based reading activities experience substantially greater developmental benefits compared to their peers using traditional books, highlighting the effectiveness of interactive and digital formats in early learning.

4. Conclusion

This study looked at the effects of technology-based reading on the language development, attention span, and socialemotional reactions of preschoolers and nursery children in Balmain, New South Wales, in comparison to traditional book reading. According to the results, conventional book reading tends to provide better results in sustained attention, expressive language usage, and parent-child or educator-child engagement, even if both reading modes boost early learning. Although it varied according to the quality of digital content and adult involvement, technology-based reading demonstrated the potential for engagement and novelty.

The findings underscore the ongoing significance of integrating conventional reading methods into early learning environments, particularly in the context of Australian early childhood education, which places a strong focus on playbased and relational learning. However, when carefully chosen and directed by teachers or educators, technology may be a useful aide.

In order to meet a range of learning requirements in the early years, the study emphasises the necessity of balanced, developmentally appropriate reading experiences that use both print and digital resources.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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