

The Childhood Development Initiative

Doodle Den report for the academic year 2020/2021



Any citation of this report should use the following reference:

Reilly, E. and Shumba, J. (2022). *Doodle Den report for the academic year 2020/2021*. Dublin: Childhood Development Initiative

Published by Childhood Development Initiative CLG

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1. Introduction

Doodle Den is an after-school programme which uses an evidence-based curriculum featuring a balanced literacy framework (Biggart, Kerr, O' Hare & Connelly, 2012; Biggart, Sloan & O' Hare, 2014). The programme is distinctive in that it focuses on improving children's literacy through a wide range of play-based activities in an after-school setting. It has a child, parent, and family component, and places a strong emphasis on parental engagement. Doodle Den has a manual with detailed guidelines to maximise fidelity of implementation. Fifteen Senior Infant children participate in three 90-minute sessions per week which are facilitated by a teacher and another facilitator with a third level qualification such as Early Childhood Education and Care or Social Sciences. There are six parent sessions and three family sessions per year. The key anticipated outcomes are improved key literacy skills such as writing, phonics and sight vocabulary. Other non-academic outcomes are improved social skills and school attendance.

More than a quarter of children in Ireland are living in, or are at risk of, poverty (Social Justice Ireland, 2021). Children who grow up in poverty are more likely to leave school early and without having attained fundamental literacy skills. Literacy is widely acknowledged as the foundation for academic attainment across the curriculum. Children who fall behind in literacy at an early stage are likely to remain behind (Brooks, 2007; Francis et al, 1996; Juel, 1988), with consequences for later academic achievement and access to employment (Biggart, Sloan & O'Hare, 2014). This last year has posed significant challenges for children and their families, and these challenges extended into the school environment. Despite this, the resilience and determination of the children's schools, teachers, facilitators, and parents shone through. This report highlights again the effectiveness of Doodle Den as an intervention that continues to yield rich learning foundational literacy skills and social skills for the children who participate.

1.1. Programme Delivery

Doodle Den operates throughout the normal school year, over a 32-week period, and is aimed at 5- and 6-year-olds (Senior Infants class). It involves the children attending three after-school sessions per week, each lasting 1½ hours. During this academic year 2020/2021 Covid 19 resulted in significant disruption to schools delivering classes in person, with schools switching to remote learning at home over the course of the academic year.

The schools that delivered Doodle Den whilst schools remained open followed all Covid-related policy and procedures. This required certain adaptations to the routine and environment. Each child needed their own equipment and materials, and therefore each child was provided with their own "Doodle box" with all the resources needed for these sessions.

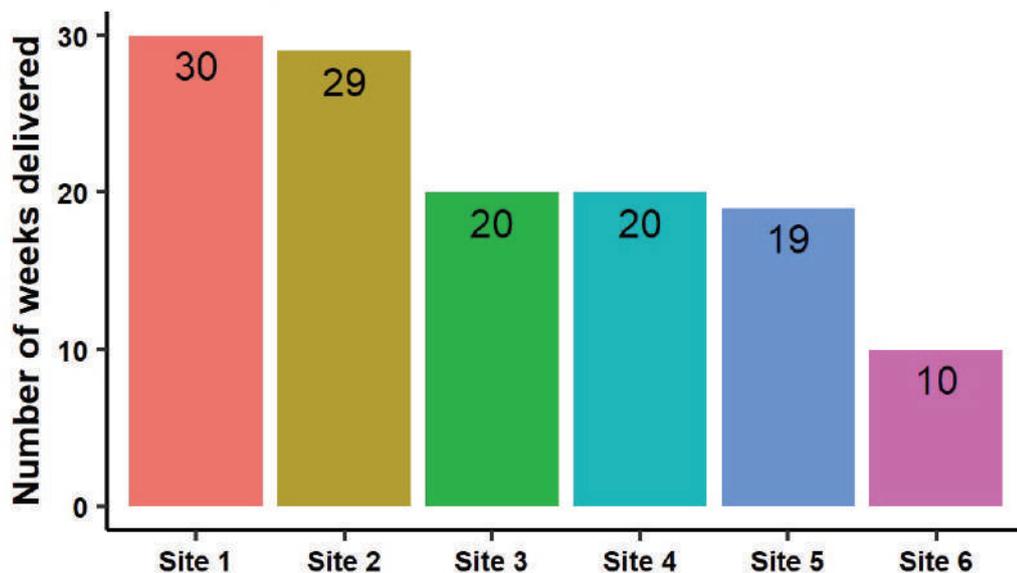
Sessions for children had to be completed 10 minutes earlier than usual to facilitate staggered pick-up times to control the volume of parents picking up children from school at any one time. In some schools, children's social contact was reduced due to the pandemic, owing to the use of the pod system to reduce the numbers of contacts children had whilst in school. There were no reports of Covid 19 infections in any of the Doodle Den sites.

The move to remote learning presented significant challenges in the delivery of Doodle Den, as it proved impossible to maintain fidelity of delivery. In consultation with the facilitators delivering the programme about managing school closures, it was agreed that maintaining Doodle Den contact and the relationship with the children and their families was crucial. This contact would consist of manageable elements of the Doodle Den intervention delivered to the children and their families in several ways. For example, the facilitators would record themselves via Google Schools or Seesaw outlining shared writing activities, phonic activities, Big Book reading and shared reading activities. These activities followed the curriculum contained within the Doodle Den manual. Content was condensed into shorter than normal time periods, as children would not have been able to maintain concentration for 90 minutes remotely, and indeed parents may not have had the time to support their children for this length of time.

Parents’ sessions were not conducted face to face. The content for the parental elements consisted of either recorded sessions or live Zoom sessions for the parents.

While the degree to which these changes affected the expected outcomes is not known, as the management of delivery was fluid to ensure as much of the programme was delivered with as close to fidelity as was possible. Of the nine sites we have data for six of those sites with respect to the dosage of delivery. It is estimated that schools delivered approximately between 59.3% and 93.75% of the programme content. This is an acknowledged limitation of this report.

Figure 1: Doodle Den Delivery across six sites



2. Methodology

The Doodle Den data were collected from nine schools which were implementing the programme in the academic year 2020 to 2021. All the schools were in Dublin. This year was particularly challenging as Covid 19 restricted the delivery of the programme due to school closures, and so it was not possible to maintain fidelity to the programme. Even though schools closed due to the Covid-19 pandemic, facilitators engaged with as many of the children and parents as possible, to remain connected and deliver as much of the content as possible. How they did so is discussed above.

2.1. Data Collection

The intended outcomes for children after participating in the Doodle Den Programme are:

- Improved key literacy skills which are writing, phonics, and sight vocabulary
- Improved social skills

To measure if children had achieved these outcomes, all participating children had their literacy skills (writing, phonics, sight vocabulary and social skills) assessed before and after participating in the programme. Each child was assigned a unique identifier code before the programme started and all data were collected by facilitators using standardised Doodle Den assessment tools. For pre-programme assessment, all data were collected within the first month of implementing the Doodle Den Programme (September 2020) and post assessment data were collected in the last month of implementation (May 2021).

2.2. Child Assessment Instruments

To assess children's phonics, facilitators sounded letters on the English alphabetical order and children were asked to write the letter that has been sounded, and for each correct letter the child was given a score. The phonics score scale ranged from 0 to 26 with zero representing failure to get any letter correct and 26 representing getting all the letters correct.

To assess children's sight vocabulary, children were given a card with 64 words and asked to read the words. For each correct word read, the child was awarded a score. The sight vocabulary score ranged from 0 to 64 with 64 representing highest score.

For assessing children's writing skills, children were given a blank piece of paper to draw a picture of a character from their favourite book and write a couple of sentences describing the character they had drawn. From the descriptions, children were assessed on:

1. Writing left to right, top to bottom and spacing
2. Writing own name using capitals
3. Using capital letters and full-stops appropriately
4. Spelling common words correctly
5. Attempting to match sounds and letter by including obvious consonant and vowel sound in spelling
6. Writing an extended description

For each of the above skills demonstrated children were given a score. Therefore, children's writing scores ranged between 0 and 6, with six representing that the child had achieved all writing skills.

Children's social skills assessment was based on the facilitator's observations of the child's behaviour and interactions during the Doodle Den sessions. Children were assessed on five skills and each skill was rated as: 'Not displayed', 'Needs work', 'Moving in the right direction', 'Displays skill most of the time' and 'Full mastery'. The five skills assessed were:

1. Comfortable in the group setting
2. Participates well in the session
3. Interacts well with peers
4. Demonstrates good attention and concentration spans
5. Contributes to discussion

The maximum score each child could get on social skills was 25 and the minimum being 0.

Children's socio-demographic data were also collected.

2.3. Data analysis

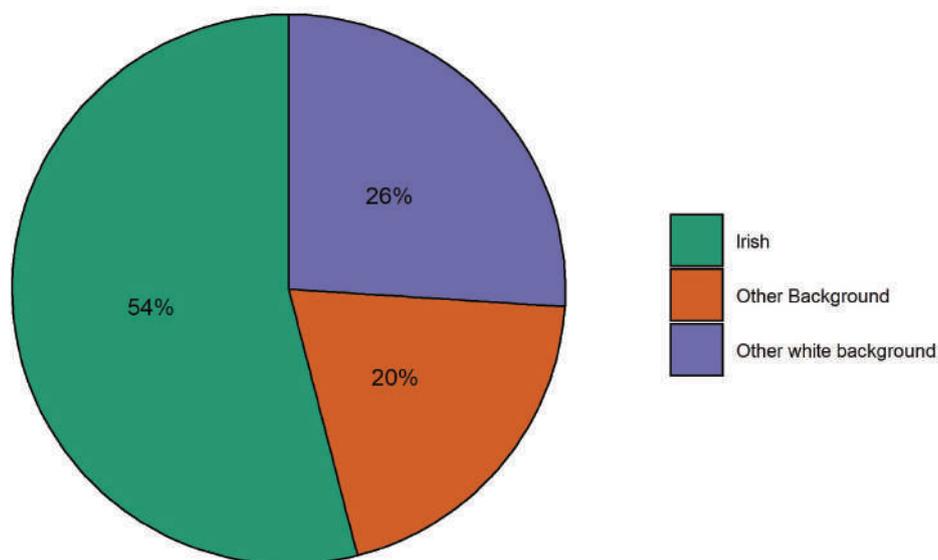
All data analyses were carried out using R Statistical Software package. Pre and Post Assessment data for children were merged using the unique identifier assigned to each child. To explore if the programme had improved children's skills (phonics, sight vocabulary, writing and social skills) paired T-Tests were conducted. Changes were reported to be significant if they reached a significance level of equal to or less than 0.05. Independent sample T Tests and One-Way Anova were conducted to explore if the changes between pre and post scores were associated with children's gender or ethnic background, respectively. For each scale only children with data available for both pre and post assessments were included in the analysis.

3. Doodle Den Results

3.1. Characteristics of the sample

Overall, 124 children completed the Doodle Den Assessment (either pre, post or both), 67 (54.03%) were girls and 57 (46.07%) were boys. 100 children provided data ethnic background data available. Some ethnic background categories had few frequencies of children and therefore ethnic background was recoded into three categories (Irish white, other white backgrounds, and any other background). Children with Irish background (including Travellers) included children who identified as white Irish only. The category “any other backgrounds” included children who identified as African, any other black background (including black Irish), Chinese, any other Asian background, and all children with mixed backgrounds. Children from “any other white background” included all other children identifying as white but not originally from Ireland. Of the 100 children with ethnic background data available, 54.0% had an Irish background, 26.0% were from other white backgrounds while 20.0% were from other ethnic backgrounds, as shown in Figure 2.

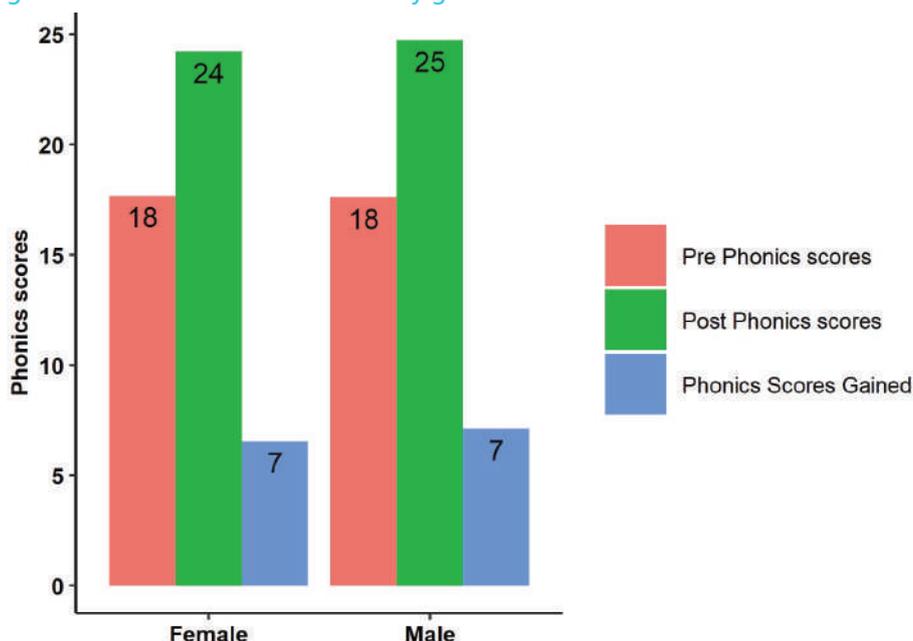
Figure 2: Ethnic background of children



3.2. Children’s phonics

Of the 124 participating children, 95 had data available for both pre and post phonics assessment. The average pre-assessment phonics score for children was 17.64 (SD=6.27) while the average post-assessment phonics score was 24.44 (SD=2.44). Children’s phonics scores significantly improved after the programme as compared to the beginning of the programme ($t(94) = 11.849, p < 0.001$), with an average 6.8-point increase when compared to the pre-assessment score. 92.6% of children improved their phonics scores, 5.3% of children’s phonics scores did not change, while 2.1% of children saw a negative change in phonics scores after the programme. After exploring the relationship between children’s gender and phonics scores, boys appeared to have gained more on average (7.12 scores) compared to girls (6.54). However, these differences were not significant ($p = 0.6239$). This indicates that boys’ and girls’ phonics improved equally from the Doodle Den programme, (see Figure 3). 92.3% of boys improved their phonics while 93.0% of girls did so.

Figure 3: Children’s Phonics scores by gender

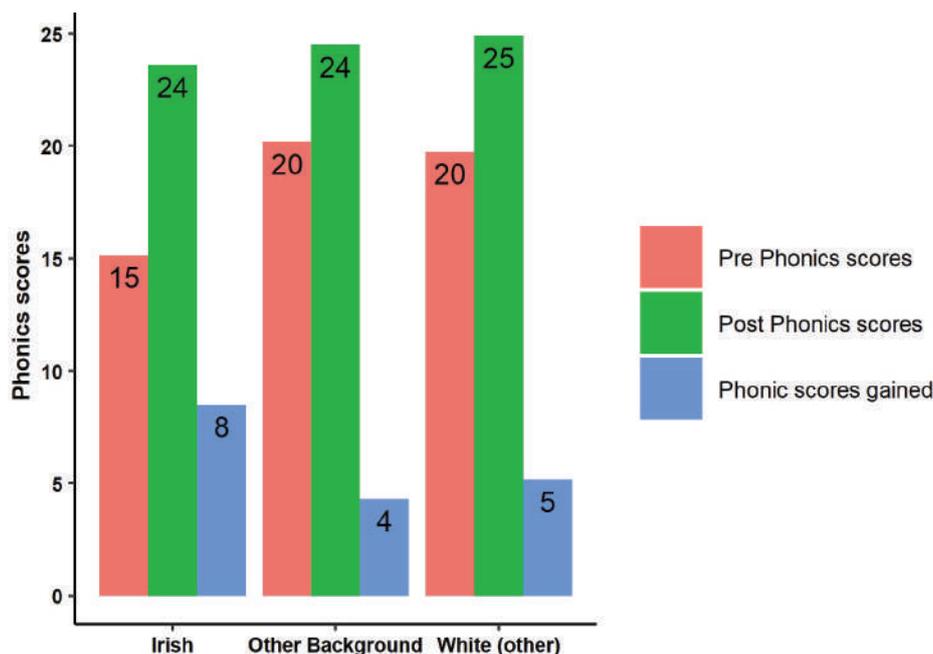


3.2.1. Ethnic background and phonics score

Before the programme, children from “any other backgrounds” had the highest phonics score (Mean=20.19, SD=4.15) while children from “other white backgrounds” had an average score of 19.75 (SD=6.29) and children with an Irish background had a score of 15.13 (SD=6.09). After the programme, the average phonics score for children with “any other backgrounds” improved to 24.50 (SD=1.86) while children with “other white backgrounds” had an average score of 24.91 (SD=1.38) and children with an Irish background had an average of 23.62 (SD=3.25). However, children with an Irish background appeared to have gained most from the programme as they had an average 8.49-point increase after the programme, children from “any other backgrounds” had an average of 2.87 points increase while children from “other white backgrounds” had an average of 5.90 phonics points increase after the programme.

The average scores children gained after the programme varied with ethnic background significantly, [F(2, 27.18)=5.057, p<0.001]. After post hoc analysis was conducted, results showed that children with an Irish background gained significantly more than children with “any other backgrounds” (p=0.02), and Irish children had gained significantly more than children with “other white backgrounds” (p=0.041). However, there were no significant differences in scores gained between children with “other white backgrounds” and children from ‘other’ backgrounds. When expressed as a percentage, 100% of children with a white Irish background had improved their phonics, compared with 93.8% of children with ‘other’ background, and 83.3% of children with ‘other white’ background. Figure 4 below shows the phonics scores by ethnic background.

Figure 4: Phonics scores by ethnic background

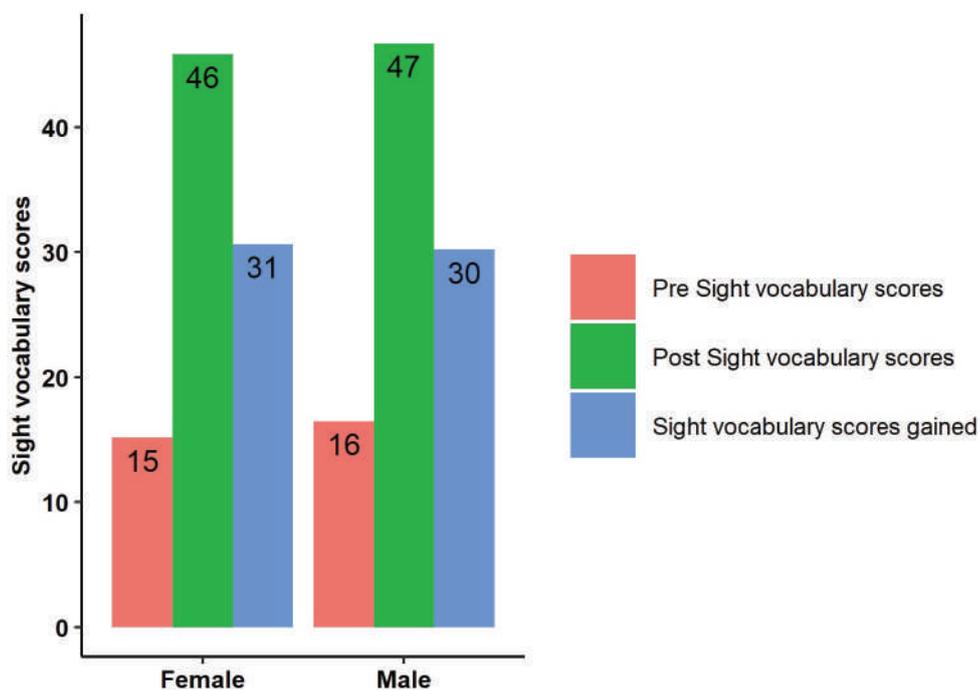


3.3. Sight Vocabulary

A total of 114 children had sight vocabulary data available in both pre and post programme assessments. Overall, the average sight vocabulary score for children before the programme was 15.80 (SD=16.40) and 46.24 (SD=18.18) after. On average, children gained 30.42 scores (SD=17.00) after the programme, representing a significant improvement in sight vocabulary scores, [t (113) =19.139, p<0.001]. 98.2% of children had improved their sight vocabulary, while one child had no change in scores and one child had a negative score (below zero) after the programme.

The proportion of boys and girls who improved in the sight vocabulary domain was similar. In the pre-programme sight vocabulary assessment, the average score for girls was 16.00 and for boys 16.49. These scores increased to 45.84 for girls or an increase of 30.64 (SD=16.33) and 46.70 (or an increase of 30.21 (SD=17.85)) for boys. There were no significant differences, between boys and girls, in the scores children achieved after the programme. See Figure 5 below.

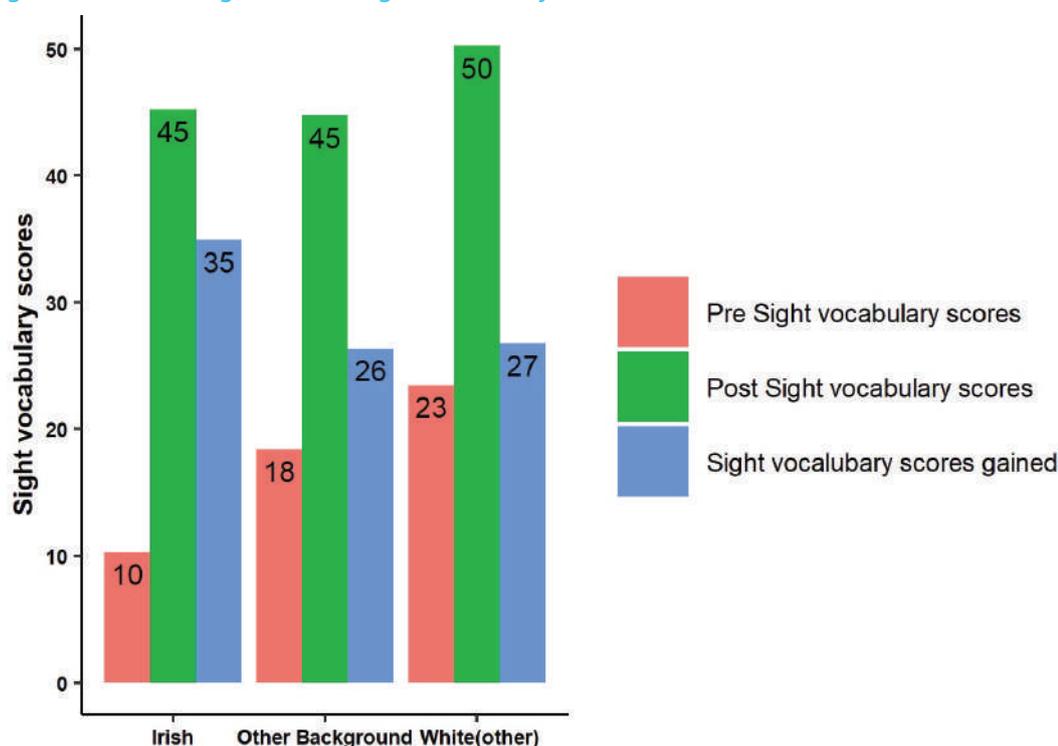
Figure 5: Children’s gender and sight vocabulary



3.3.1. Sight Vocabulary and ethnicity

Children with an Irish background had the lowest sight vocabulary score at pre assessment with an average of 10.28, followed by children from “any other backgrounds” with an average score of 18.40. Children from “other white backgrounds” achieved the highest scores with an average of 23.48. After the programme, the group with the highest scores were still children from “other white backgrounds” with an average score of 50.24, followed by children with Irish backgrounds with an average score of 45.23 and lastly children with “any other backgrounds” with a score of 44.75. However, children with an Irish background gained the most from the programme with an average gain of 34.94 scores, while the average gain for children with “other white backgrounds” and children from “any other backgrounds” were similar with a score of 26.76 and 26.35, respectively. After exploring how ethnic background affected sight vocabulary scores, the differences were significant [$F(2, 1705) = 3.352, p = 0.0392$], indicating that children with an Irish background had gained significantly in sight vocabulary compared to children from other ethnic backgrounds. Figure 6 below displays sight vocabulary scores by ethnic background.

Figure 6: Children’s gender and sight vocabulary

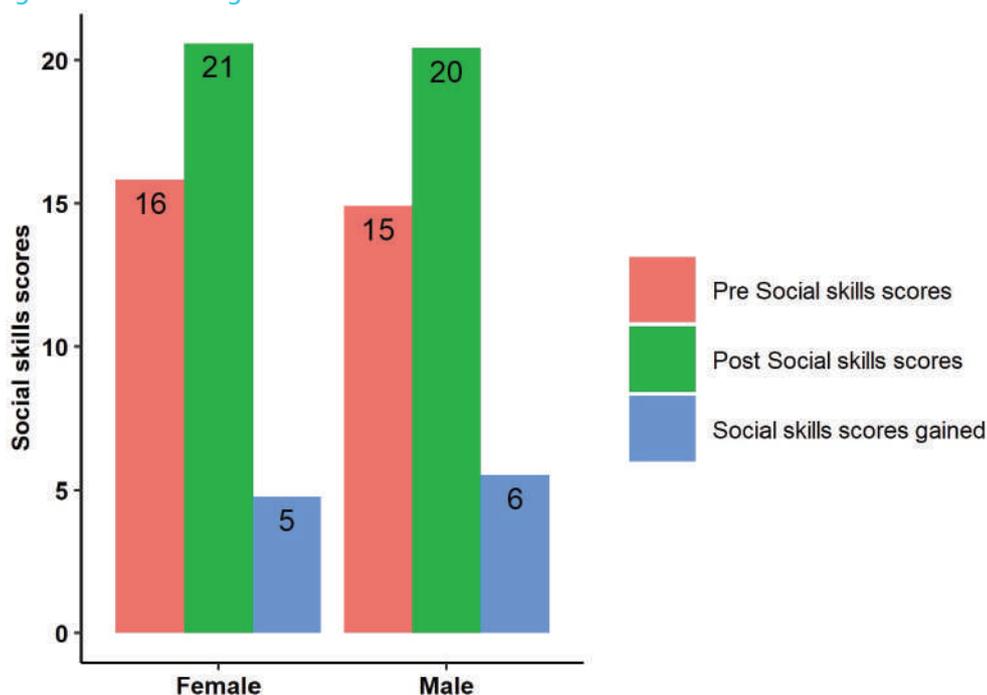


3.4. Social Skills

There were 115 children with data available for both pre- and post-programme social skills assessment. The average score for children prior to receiving Doodle Den was 15.4 (SD=3.59), increasing to 20.50 (SD=3.86) at post assessment. Between pre and post assessment children had gained an average of 5.10 scores for social skills (SD=3.67). The difference in social skills scores between pre- and post-assessment were highly significant [$t(114) = 14.909, p < 0.001$] indicating that the programme had improved social skills for children. When expressed as a proportion, 89.6% of children had improved their social skills, while 5.2% showed no change (social skills score stayed the same) and a similar proportion (5.2%) demonstrated a decline in their social skills worsening after the Doodle Den Programme.

The relationship between social skills scores and gender was explored. The average score for girls before the programme was 15.82 (SD=3.29) and for boys, 14.91 (SD=3.88). After the programme, the average score for girls had improved to 20.58 (SD=3.71) and for boys, it had improved to 20.41 (SD=4.07). On average, boys had gained more than girls with an average score of 5.51 compared to 4.76. The difference in scores gained by girls and boys was not significant, [$t(105.23) = -1.085, p = 0.2804$], indicating that boys and girls had similar gains in social skills. When expressed as proportions, 90.3% of girls had improved their social skills while 88.7% of boys had improved the same.

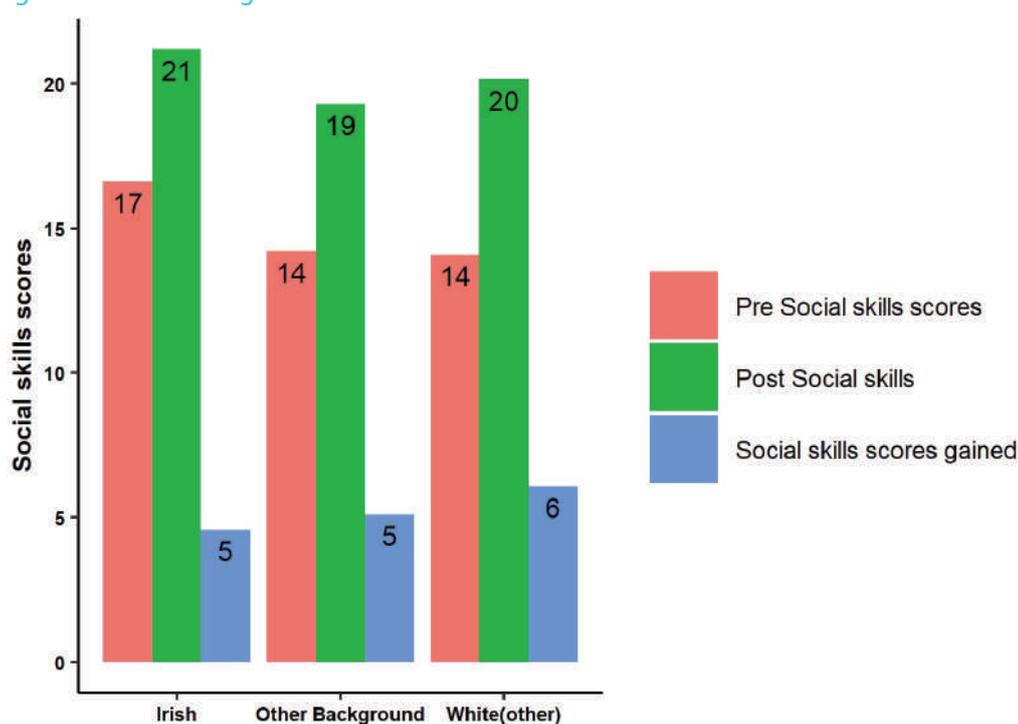
Figure 7: Children’s gender and social skills



3.4.1. Social Skills and Ethnicity

With regards to ethnic background, children with an Irish background had the highest pre-social skills assessment score of 16.62 (SD=3.61). Children from “other white backgrounds” and children from “any other backgrounds” had similar scores in pre-assessment, (Mean=14.07, SD=3.25) and (Mean=14.20, SD=2.95), respectively. Children gaining the most after the programme were children with “other white backgrounds” who gained an average of 4.20 scores, followed by children from “any other backgrounds” who gained 3.68 scores. Children with Irish backgrounds gained 3.59 scores after the programme. The differences between these score gains by ethnic background were not significant (p= 0.253). While 86.8% of children with an Irish background improved their social skills, 92.3% of children from “other white background” did so and 90.0% of children from “any other background” demonstrated improvements. Figure 8 below shows the social skills scores by ethnic background.

Figure 8: Ethnic background and social skills



3.5. Writing Skills

There were 89 children with data available for writing skills from both the pre- and post-assessment. In pre-assessment, the average child had a score of 1.79 and this improved to 4.16. Children improved two writing skills after the programme: “writing left to right, top to bottom and spacing” and “writing own name using capitals”. Although there was an improvement in children’s skills in writing extended descriptions, the improvement was found in only half the children in the Doodle Den Programme. Areas that worsened marginally during the Doodle Den Programme were children’s use of capital letters and full stops appropriately and spelling common words correctly. See Table 1 below.

Table 1: Children’s writing skills

	Pre-Programme Assessment		Post-Programme Assessment	
	Achieved % (n)	Not Achieved % (n)	Achieved % (n)	Not Achieved % (n)
Writing left to right, top to bottom and spacing	42.70% (38)	57.30% (58)	86.52% (77)	13.48% (12)
Writing own name using capitals	69.66% (62)	30.34% (27)	93.26% (83)	6.74% (6)
Using capital letters and full-stops appropriately	14.61% (13)	85.39% (76)	47.19% (42)	52.81% (47)
Spelling common words correctly	18.0% (16)	82.0% (73)	78.65% (70)	21.35% (19)
Attempting to match sounds and letter	18.0% (16)	82.0% (73)	76.40% (68)	23.60(21)
Writing an extended description	15.73% (14)	84.27% (75)	32.58% (29)	64.42% (60)

Summary of findings

The key skills children are expected to have improved after participating in the Doodle Den Programme are phonics, sight vocabulary, social skills and writing skills. The findings presented above show the positive changes children experienced after participating in the Doodle Den Programme. Key demographics used to explore their relationship with improvement in literacy and social skills were child’s gender and ethnic background.

Despite the delivery of Doodle Den being affected by the Covid-19 pandemic, children who completed the programme and had data available for analysis seemed to improve in all the areas of literacy. Most children improved their sight vocabulary (98%), phonics (92%) and social skills (89%). The implementation of the Doodle Den Programme had to be adapted to suit the restrictions imposed due to the Covid-19 pandemic.

4. Discussion

There was an even representation with respect to gender across the data sample. The findings show that children from diverse ethnic backgrounds participated in Doodle Den Programme with 54.0% identifying as white Irish, 26.0% identifying as being from other white backgrounds while 20.0% were from other ethnic backgrounds.

One of the anticipated outcomes of the programme is the improvement of phonemic ability. Phonics is the knowledge that a particular letter or pattern of letters represents a sound. This knowledge can be used by a child to read and spell words. Knowledge of the letter-sound system is essential for learning to read in English (NEPS, 2016). Almost 93% of the children's phonic scores improved. There was little difference between gender in this variable, however the children who identified as white Irish demonstrated greater improvements their phonics scores than the other two ethnic variables. The white Irish children however began at a much lower base than the other children, but on completing the programme, all ethnic groups had very similar scores.

The Doodle Den Programme aims to improve children's literacy (writing, phonics, sight vocabulary) and social skills. Across these skills, it was observed that the programme had the same impact on girls and boys. However ethnic background seems to have been related to improvement in social skills, phonics and sight vocabulary. It must be noted that children from a White Irish background (including Irish Traveller) made up most of the children participating in the Doodle Den Programme. Therefore, although ethnic background seems to be associated with children's improvement in literacy skills, these results cannot be generalised beyond the Doodle Den programme.

Findings on children's writing skills show most children had improved on the following: "writing left to right, top to bottom and spacing"; "writing own name using capitals"; "spelling common words correctly" and "attempting to match sounds and letter". Across these writing skills, at least 75% of children demonstrated improvements. Although there were positive changes in the proportion of children improving in "writing extended description" and "writing using capital letters and full-stops appropriately", less than 50% of the children after the programme had improved on these skills. While the reasons for fewer children improving these skills is not apparent, it may be possible that some of the Doodle Den sessions were affected by the closure of schools and could not be implemented face to face.

A key strength of the Doodle Den Assessment data is the use of a pre and post method which allowed for paired analysis of the literacy changes before and after the programme. All the assessments were standardised across the schools implementing the Doodle Den programme and all facilitators were trained on how to conduct the children's assessments. This improved the accuracy of the Doodle Den results.

One of the weaknesses of the Doodle Den data relates to data missing in both pre and post assessments. A significant proportion of children did not have data available in both pre and post assessment data and therefore could not be included in the analysis. This reduced the sample size for analysis.

5. Recommendations

Findings in this report demonstrate the strong evidence of the effectiveness of the Doodle Den Programme in improving children's literacy outcomes and the positive effect of the programme on children's social outcomes. The report highlights ways in which literacy development can be best supported in Ireland, both within schools, homes, and extracurricular activities such as Doodle Den. CDI has five key recommendations for effectively targeting literacy in early childhood as follows:

- Doodle Den is offered as part of a menu of evidence-based programmes for delivery within the School Completion Programme and other services working with young children in an after-school setting.
- A further evaluation of the Doodle Den Programme be conducted to assess the social value the programme offers to its stakeholders, mainly children and parents.
- A further exploration to include a pre and post evaluation of a control group (without the intervention) for comparison in 2022-2023 iteration of delivery.
- Training and supports are provided to appropriate structures to ensure fidelity of intervention delivery, and so maximise the potential for positive outcomes.
- Children seemed to struggle to achieve some of the writing skills after the programme. It is important that the future implementation of the Doodle Den Programme put more emphasis on writing skills for children.
- School attendance was found to be improved in the RTC in 2012; from 2021 school attendance is to be included in the assessment tool to establish if this remains the situation.

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