



# Designing and Implementing a Family Literacy Program Through Smartphones: How Does Recruitment Method Influence Uptake and Attrition?

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## Abstract

Texting-based programs are increasingly used to support parents as their child’s first teacher and create links between home and school. However, there is scant evidence about the influence of program implementation on parent uptake and attrition—a key component of such programs. This article describes the design and delivery of Kindytxt, a literacy-based text-messaging program for parents with a child at Kindergarten in Western Australia, and examines the influence of recruitment method, area socioeconomic status, and teacher participation on parent uptake and attrition. Results indicate that embedding Kindytxt into a well-established family literacy program provided the infrastructure and mechanism for extensive program reach, and the recruitment method, specifically the involvement of the kindergarten teacher, significantly influenced parent registration. However, attrition rates were not significantly affected by the area socioeconomic status of participating schools, recruitment method, nor teacher participation in Kindytxt. The results suggest that teacher involvement may be the crucial factor in enabling parents to access texting programs, regardless of the socioeconomic status of the school community. The design elements may be used to inform future program development, and the research results highlight the importance of documenting and including the method of delivery as variables in the evaluation of program implementation.

**Keywords** Text-messaging program · Uptake · Attrition · Kindytxt · Literacy · Family/school/library connections

## Introduction

“Kindytxt” is a literacy-focused text messaging program conceptualised by Barratt-Pugh, and developed by Barratt-Pugh, Barblett, Johnson and Hill. Kindytxt emerged from over a decade of work on the evaluation of “Better Beginnings” (BB), a universal kindergarten family literacy program (FLP) developed by the State Library of Western Australia (SLWA) (Barratt-Pugh et al., 2021). Better Beginnings is offered to all schools and childcare centres with a kindergarten program in Western Australia (WA), reaching some 37,000 families each year (SLWA, 2021). The aim of BB is to support parents as their child’s first teacher and foster a positive link between families, schools, and libraries through a book-gifting program. Better Beginnings provides

resources to promote parent–child interactions around literacy and information for teachers that links BB to the WA Kindergarten curriculum. It includes a reading pack, literacy activities at the local library, information for kindergarten teachers and a dedicated SLWA website for parents, educators, and librarians to access resources (<https://www.better-beginnings.com.au/reading-packs>).

Interagency collaboration is fundamental to the implementation of BB as a vehicle for creating an ongoing connection between families, schools, and libraries, sustaining literacy messages, increasing access to resources/activities, and enhancing professional growth through shared knowledge (Barratt-Pugh et al., 2021; Caspe & Lopez, 2018; Hindman & Morrison, 2011; Padak et al., 2002; Timmons & Pelletier, 2015). Ideally, kindergarten teachers and librarians work together throughout the year, beginning with a jointly-hosted school event to introduce BB, followed by a rolling program of library activities with reciprocal kindergarten-library visits.

Cross-sectional evaluations of the BB Kindergarten program indicate that it has been well received, and

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participating families reported an increase in their home literacy practices and library membership (Barratt-Pugh et al., 2021). However, families also identified challenges in maintaining and enhancing engagement in literacy activities. Thus, our research established the need to find novel ways of sustaining the momentum of BB to help families achieve optimal family literacy outcomes. This challenge came into sharp focus as the COVID-19 pandemic emerged, raising questions about how to extend BB, a program that was designed to be driven by face-to-face interactive support from librarians and teachers. This article presents insights into the design of Kindytxt as an integrated component of a well-established FLP and, in particular, examines the influence of program implementation on recruitment (school and parent uptake) and participant retention/attrition.

## Literature Review

Over the past three decades, growing recognition of the importance of parents as their child's first teacher has led to a number of FLPs drawn from different theoretical, pedagogical and implementation frameworks that focus on parent-child interactions, often through book sharing practices (de Bondt et al., 2020). The review of FLP evaluation studies by Carpentieri et al. (2011) and a meta-analysis of FLP studies by Sénéchal and Young (2008) have concluded that overall children's literacy learning is enhanced through family engagement in such programs. Evidence suggests the relationship between program design features and program effects are seldom included in evaluations of FLPs, yet may provide insight into varied results, as well informing future program development (de la Rie et al., 2017; Doyle, 2012). Indeed, de la Rie et al. (2017) argue that while the ways in which FLPs are delivered, received and enacted influence program effectiveness, "...systematic information on program implementation is lacking" (p. 6). Research also suggests that one of the most important aspects of implementation is the method of recruitment/retention, particularly for families identified as being at risk (Doyle, 2012; Garcia & Hasson, 2004).

Developments in technology have led to a growing number of family-oriented text messaging programs (TMPs) (Meuwissen et al., 2017; Snell et al., 2020; York et al., 2019). In Australia, approximately 92% of the population own a smartphone (Deloitte, 2021), suggesting most Australian parents have access to a Short Message Service (SMS) (Knight & Hunter, 2013). While recognising the challenges of technology use, such as differentiated access and concerns about privacy/safety and ethical behaviour (Cook, 2016; Knight & Hunter, 2013), TMPs have the potential to support parents because the messages are accessible, brief, and therefore potentially easy to read

and enact (Meuwissen et al., 2017). York et al. (2019) found that short, simple texts about parent-child activities build parents' self-efficacy, while information about the purpose of activities supports parents' knowledge and understanding of early literacy, and extension activities provide a structured and systematic way of consolidating and building literacy practices. Cortes et al. (2021) and Fricke et al. (2018) have confirmed that this model of three texts reduces opt-outs compared to programs that send activities alone. In addition, text messages can be targeted to particular audience needs, personalised (Doss et al., 2019) and translated into other languages, and afford parents new opportunities for learning and practice (Daugherty et al., 2014). TMPs also create new communication channels for organisations, with the added benefits of asynchronous communication and the capacity to incorporate ongoing evaluation of the program (Daugherty et al., 2014). Furthermore, emerging studies suggest that TPMs have the potential to increase home-school connections (Snell et al., 2020).

In terms of literacy benefits, studies have found that literacy TMPs improve parent engagement in literacy activities (Hurwitz et al., 2015; Meuwissen et al., 2017; Snell et al., 2020), increase children's educational outcomes (York et al., 2019), and can extend the reach of existing literacy initiatives (Jimenez et al., 2021; Meuwissen et al., 2017). Augmenting family learning/literacy programs through TMPs offered to parents enables agencies to expand the reach and impact of their core business by encouraging and supporting parent uptake and engagement in such programs (Hurwitz et al., 2015; Knight & Hunter, 2013; Meuwissen et al., 2017), in addition, a study of Reach-Out-and-Read reported that adding texts and video, produced an increase in home literacy practices, over the original program alone (Jimenez et al., 2021). Indeed, researchers have highlighted the importance of provider involvement in TMPs to help families to access and utilise technology in meaningful ways (Cook, 2016; Daugherty et al., 2014). Fostering parent-teacher communication through TMPs has also been identified as a means of engaging parents in literacy (York et al., 2019).

The evaluation of TMPs presents challenges given the decontextualised nature of implementation and enactment. While there is good evidence that literacy TMPs improve parent engagement in literacy activities, there is little evidence of the differential effects of recruitment/retention strategies. Thus, little is known about implementation strategies that are effective in engaging families in text-based literacy programs. Hence, this article seeks to address the following research questions:

**RQ1** How is the uptake of Kindytxt by schools and parents influenced by method of recruitment, area socio-economic status, and kindergarten teacher participation?

**RQ2** How is parent attrition from the Kindytxt program influenced by method of recruitment, area socio-economic status and teacher participation?

## Program Design

### Theoretical Framework

The design of Kindytxt was aligned to the theoretical orientation of BB which was derived from a sociocultural perspective that foregrounds the important role of families in literacy learning and emphasises the interactive nature of learning (Vygotsky, 1978). Research suggests that helping families connect with school literacy practices through shared book-reading, songs and rhymes has a range of literacy benefits that lead to improved educational outcomes (de Bondt et al., 2020; Mol & Bus, 2011; Steiner et al., 2022). Kindytxt was conceptualised as a means of enhancing parent–child engagement in literacy activities and supporting school-family-library connections, implemented through interagency collaboration. It was designed with low socio-economic families in mind, given that evidence suggests there is a potential disconnect between the literacy practices of schools and disadvantaged families and that disadvantaged families are ‘harder to reach’ and typically gain less from FLPs than more advantaged families (Hannon et al., 2020). Thus, Kindytxt was designed for a target audience but delivered through BB—a universal program.

Kindytxt also encompassed the concept of co-design. Key stakeholders were directly involved via an education/technology consultative committee, an advisory committee, and a working party. The latter included representatives from six local libraries with a high proportion of disadvantaged families and kindergarten teachers drawn from 10 schools in the library catchment areas. Each committee was involved in an iterative decision-making process across a 2-year period, providing input commensurate with their role, knowledge, and experience.

### Key Literacy Components

A literature review was undertaken to identify key components of early literacy from the academic and grey literature, including influential international and national reports and national and state/territory curriculum documents, alongside established text-messaging programs such as Ready4K (York et al., 2019). The multiplicity of literacy components

identified was then examined in light of research about FLP programs and suitability to the WA context—in particular, alignment with BB and the WA Kindergarten Curriculum Guidelines (School Curriculum & Standards Authority, 2014). This process led to the creation of three universally-acknowledged key components of early literacy:

- Concepts about print
- Oral language and phonological awareness
- Symbols and pattern systems

All three literacy components, with particular emphasis on the first two, formed the basis of the Kindytxt messages.

### Language

Although WA is rich in linguistic diversity and in 2021 over 22% of people spoke a language other than English at home (Australian Bureau of Statistics [ABS], 2022), project funding limitations meant the messages could only be offered in English. Hence, it was important to ensure the literacy concepts and skills were relatively easy to understand, that the literacy activities were easily accessible and doable to avoid overloading parents (Fikrat-Wevers et al., 2021) and, where possible, that support mechanisms were provided through the implementation of Kindytxt. Information from research, stakeholders, and the working party suggested that many families who speak English as an additional language or who have low English literacy skills prefer text messages over paper-based school communication and may use strategies such as translation apps or text-to-speech apps (Daugherty et al., 2014; Snell et al., 2020) and/or enlist older children, other parents and/or teachers/community leaders to read and translate school-related messages (Snell et al., 2020).

### Text-Message Content, Sequence and Format

A scope and sequence exercise was undertaken to determine the specific content and optimum order of the Kindytxt messages. It was important that the number and sequence of texts would allow for continuity within and across literacy components, gradually building in conceptual complexity. The texts were therefore delivered across 30 weeks allowing for a substantial number of activities to sustain and extend family literacy practices. The first 13 weeks of the program introduced concepts of print as these are relatively easy to explain in writing and enact, and have the potential to create a love of books through enjoyment and child-parent bonding, thus motivating parents to continue their engagement in literacy activities and Kindytxt. Since every family receives a gift book as part of the BB reading pack, there was no disadvantage for families who otherwise may not have had books in the home. Weeks 14–25 introduced

concepts of phonological awareness, phonics, and oral and aural language skills, and were based on everyday activities and games. The final texts (weeks 26–30) introduced the concepts of symbols and pattern systems with a focus on recognising and naming letters in everyday contexts. Parents received a bundle of three texts per week (90 in total) consisting of:

Activity (Friday): describing specific activities related to everyday experiences,

Information (Saturday): stating the purpose of the activity, and

Extension (Sunday): encouraging parents to build on the activity to consolidate learning, sometimes suggesting that their child leads the activity in order to maximise involvement/engagement and agency.

The following extracts from the early weeks of the program illustrate the increasing complexity of concepts:

*Week 2 texts*

Activity (Friday): *Choose a children's book [📖] & read it out loud to your child.*

Information (Saturday): *Sharing books every day helps your child become familiar with books.*

Extension (Sunday): *Ask your child to choose a book. Read it together.*

*Week 7 texts*

Activity (Friday): *Read a book your child knows. Stop half-way and say: Can you tell me the rest of the story?*

Information (Saturday): *Knowing that stories have a beginning, middle and end helps your child to understand the structure of stories.*

Extension (Sunday): *Read a book your child knows. Say: Can you make up a different ending?*

In designing the format of the Kindytxt program, we gratefully acknowledge the Ready4K model developed by Parent-Powered (<https://ready4k.parentpowered.com/research.html>) and the subsequent research evidence (York et al., 2019) which confirmed the efficacy of the Ready4K model of three text messages per week in the format of 'Fact', 'Tip', and 'Growth'.

## Participant Feedback

A further design element was the embedding of feedback for evaluation purposes in the texting program. Sets of three simple, fixed-response questions were sent via text at fixed intervals to help ascertain readability, appropriateness and application of the Kindytxt content, and the timing of delivery. The feedback questions were delivered on Tuesday to distinguish them from the regular program. To respond,

participants simply texted the number corresponding to their preferred answer. Parents received feedback questions at weeks 6, 9, 12, 18, 24, 27 and 30 (total of 21 texts); teachers and library staff received feedback questions at weeks 10 and 20 (six texts) and a link to a more comprehensive online survey at week 30. This article draws on a small subset of the parent and teacher feedback questions that had direct implications for program implementation in relation to uptake and attrition.

## Methods

### Target Population and Intended Sample

As Kindytxt was designed and offered as a free resource to complement the BB Kindergarten program, the target population for our research encompassed the following:

- schools and kindergarten teachers that participate in BB,
- local public libraries and library staff that deliver BB reading packs to schools in their catchment area, and
- parents of kindergarten children that receive BB reading packs within the participating schools.

In 2021, a total of 949 schools in WA were providing kindergarten programs and therefore eligible to participate in BB. Since schools can register for BB throughout much of the school year, a cut-off date for disseminating Kindytxt to BB schools was imposed to allow time for all text messages to be delivered to parents within the project timeframe. The intended "convenience sample" was therefore limited to the 742 schools (or 78.2% of all eligible schools) that had registered for BB by 15 July 2021, the parents of the more than 29,000 kindergarten children enrolled in those schools, and the 230 associated local public libraries. The intended sample included representation from all eight education regions (as defined by the WA Department of Education) and 112 of the 138 local government areas (LGAs) in WA.

### Participant Recruitment

To inform potential participants about Kindytxt, a visually appealing information flyer ("Kindytxt flyer") was created providing a succinct description of the program, instructions on how to register for and opt out of Kindytxt, and assurance that any personal information shared (e.g., mobile phone number, school name) would be kept strictly confidential. Since the simple evaluation questions built into the texting program were to be used for research purposes, a clear statement about research consent was also included. Three

different methods were used to disseminate the Kindytxt flyer and recruit participants, as described below.

### Recruitment Method 1: Case Study BB Schools (n = 10)

The Kindytxt working party included representatives from six public libraries and 10 of the affiliated BB schools that were based in LGAs with high proportions of disadvantaged families, as defined by the ABS Index of Relative Socio-Economic Disadvantage (IRSD) (ABS, 2018). All 10 schools agreed to participate in the research as case studies. Parent information sessions about Kindytxt were held at each case study school, as part of the BB program at the start and/or end of the school day to maximise parent attendance. These sessions were attended by one or more members of the research team, the kindergarten teacher(s), and the local librarian. Parent attendance varied from school to school. After introducing parents to the BB reading pack, Kindytxt flyers were distributed and explained to parents, and a demonstration was given on how to register for Kindytxt. Parents were able to ask questions and receive individual assistance if they wished to sign-up for Kindytxt immediately. At some schools, staff were available to translate information to parents from non-English speaking backgrounds. Parents who did not attend the information session received the Kindytxt flyer with the BB reading pack given to their child.

### Recruitment Method 2: Targeted BB Schools (n = 129)

Due to financial constraints, it was not possible to produce and distribute sufficient printed copies of the Kindytxt flyer to include in the more than 29,000 BB reading packs that would need to be delivered to the total intended sample of 742 schools. Hence, a sub-set of BB schools was selected to receive printed flyers with their BB reading packs. Since BB reading packs are distributed by local public libraries, a sample of libraries that serve high proportions of disadvantaged communities was selected in consultation with the SLWA and by referring to the ABS IRSD for postal areas (ABS, 2018). The resulting targeted sample included the six libraries represented in the Kindytxt working party and a further 11 public libraries located in different local government areas. These 17 libraries were representative of all eight geographical areas of WA and responsible for delivering more than 6000 reading packs to 129 registered BB schools within their catchment areas (in addition to the 10 case study BB schools). Since LGAs and local libraries typically cover more than one postal area, 25 of the 129 schools were located in areas classified as being above the IRSD 50th percentile and therefore relatively advantaged.

Bundles of Kindytxt flyers were delivered by hand or posted to the designated staff members responsible for the BB program in the 17 public libraries who then distributed

them to the schools in their catchment areas together with the BB reading packs. This method of dissemination, therefore, established a clear link between BB and Kindytxt and ensured the flyers were delivered directly to kindergarten parents without requiring any extra effort from kindergarten teachers or other school staff.

### Recruitment Method 3: Other BB Schools (n = 603)

All other schools that had registered for BB by 15 July 2021 were invited to participate in Kindytxt via an email sent to the school administration for the attention of the principal (as required by the conditions of school-based research approvals). Attachments to the email included a digital copy of the Kindytxt flyer and information letter explaining that Kindytxt was being offered as an additional free resource for BB schools. Principals were asked to forward the email to their kindergarten teacher(s) and to distribute the Kindytxt flyer to the kindergarten parents via their school's preferred method of communication. This method of dissemination therefore occurred separately to the delivery of BB reading packs and required direct action by staff at the school. Emails containing the information letter and digital Kindytxt flyer were also sent to the 213 public libraries that deliver reading packs to the remaining 603 BB schools to inform library staff about the Kindytxt program and invite them to register to receive the text- messages.

## Data Collection

### Schools Database

Details of schools registering for the BB kindergarten program were obtained from SLWA on a weekly basis from early-March to mid-July 2021. The information included school name, number of kindergarten children requiring BB reading packs, LGA, and local public library. This database was later supplemented with publicly available information from the ABS IRSD for postal areas and Department of Education (n.d.) alphabetical list of WA schools, as well as information about teacher and parent participation in Kindytxt linked from the participant databases (described below).

### Participant Databases

As part of the Kindytxt registration process via SMS, participants were asked to indicate their main role or reason for signing up for Kindytxt, choosing from: (1) parent/caregiver; (2) teacher/school staff, or (3) librarian/library staff. As required by the conditions of ethics and school-based research approvals, mobile phone number and role were the only personal details that were compulsory for registration.



Participants were asked, but not required, to provide the name or postal area code (“postcode”) of their school or library, as applicable.

Registration data for the three participant groups were captured and collated in separate Microsoft Excel files by the mass text messaging service. Dates/times and mobile phone numbers for participants that chose to opt-out of the program before the full 30 weeks were collated separately and then linked back to the registration data via the participant’s unique mobile phone number. This article draws on data from the parent and teacher databases only. Where participants provided the name of their school, additional data about school recruitment method, school sector, school type, LGA, education region, postcode and IRSD decile (derived from the alphabetical list of WA schools and ABS postal area IRSD) were linked using the Excel “XLOOKUP” function. Where participants provided only a postcode rather than the name of their school, it was only possible to link the IRSD data. Data linking was not possible for participants who chose not to provide their school name or postcode.

**Analysis**

The school and participant databases were transferred from Excel to IBM SPSS Statistics V28 for analysis. Given the nature of the data, analyses were mainly focused on descriptive statistics and crosstabulations. Where appropriate, the Pearson chi-square test of independence was used

to examine group differences for variables measured at the nominal level. Factorial analysis of variance (ANOVA) was used to examine the main effects and interaction effects of recruitment method, teacher participation and area socioeconomic status on parent participation rates. The ANOVA assumptions of normality and equality of variance were tested before conducting the analysis. Visual inspection of plots and results of the Shapiro–Wilk test showed the parent participation rate scores were not normally distributed across all groups. However, as ANOVA is generally considered to be robust against violations of normality (Schmider et al., 2010) and the data met all other assumptions (i.e., independence and equality of variances), we proceeded with factorial ANOVA.

**Results**

**RQ1: Kindytxt Uptake**

Table 1 shows the number of schools that were invited and subsequently participated in the Kindytxt program according to the method of recruitment and area socioeconomic status (low versus high). It was not feasible, nor desirable, to recruit kindergarten parents other than via schools given the link between BB and Kindytxt and shared aims of fostering school-library-family partnerships and enhancing family literacy practices. As noted earlier, all 10 schools represented

**Table 1** School participation in Kindytxt by recruitment method and area socioeconomic status (low vs. high)

		Schools					
		Recruitment Method			Non-BB schools <sup>a</sup>	Total	
		Case study BB schools	Targeted BB schools	Other BB schools	Sub-total		
All BB schools							
Invited (intended sample)	n	10	129	603	742	–	742
Registered <sup>b</sup>	n	10	69	66	145	7	152
Participation rate <sup>c</sup>	%	100.0	53.5	10.9	19.5	–	N/A
Low SES area schools <sup>d</sup>							
Invited (intended sample)	n	10	104	292	406	–	406
Registered <sup>b</sup>	n	10	55	25	90	1	91
Participation rate <sup>c</sup>	%	100.0	52.9	8.6	22.2	–	N/A
High SES area schools <sup>e</sup>							
Invited (intended sample)	n	–	25	311	336	–	336
Registered <sup>b</sup>	n	–	14	41	55	6	61
Participation rate <sup>c</sup>	%	–	56.0	13.2	16.4	–	N/A

<sup>a</sup>No invitation to participate in Kindytxt was sent to the school. Hence, the Kindytxt flyer was presumably obtained from other sources

<sup>b</sup>Indicates at least one teacher or parent registered for Kindytxt at the school

<sup>c</sup>Only calculable for schools formally invited to participate in the Kindytxt program. Hence, participation rates exclude “Non-BB schools”

<sup>d</sup>Schools located in postal areas below the 50th percentile (deciles 1–5) according to the ABS IRSD

<sup>e</sup>Schools located in postal areas above the 50th percentile (deciles 6–10) according to the ABS IRSD

in the working party agreed to be case studies, hence the 100% participation. However, the much greater participation of “Targeted BB” compared to “Other BB” schools is particularly telling, since the latter required further layers of action from school staff (beyond registering for BB) for parents to be made aware of the Kindytxt program. Group comparisons (excluding “Case study” and “Non-BB schools”) using the Pearson chi-square test of independence showed a highly significant difference in school participation on the basis of recruitment method,  $\chi^2(1, n = 732) = 127.870, p < .001$ , but no significant difference on the basis of area socioeconomic status.

As might be expected, the influence of recruitment method on Kindytxt participation at the school level was also evident in the overall level of parent participation. Table 2 shows the total intended parent sample versus actual Kindytxt registrations and percentage participation. (A summary of the characteristics of the parent sample ( $n = 849$ ) is provided as Appendix 1). The intended Kindytxt parent sample is estimated from the number of BB reading packs ordered by schools (i.e., one reading pack per kindergarten child) and assumes one parent or family member potentially registered per child. Apart from the 10 case study schools,

overall uptake of Kindytxt was relatively low given that it was offered free of charge.

Further insight to the potentially influential role of school staff on parent participation in Kindytxt is provided in Fig. 1. Here it is evident that participation (expressed as mean percentage) was generally higher in schools where one or more teachers had also signed-up to Kindytxt ( $M = 11.5$ ) than those with no teacher registrations ( $M = 6.6$ ). We note that case study schools were excluded from this analysis since their teachers were members of the Kindytxt working party and hence registered for and directly involved in the program. A factorial (three-way) ANOVA was conducted to examine the effect of teacher participation, recruitment method, and area socioeconomic status on parent participation rate within the BB schools. As might be expected given the pattern of results in Fig. 1, there was a significant interaction between teacher participation and recruitment method,  $F(1, 127) = 3.977, p = .048, \eta^2 = 0.030$ . Simple main effects analysis with Bonferroni correction for multiple comparisons showed that teacher participation significantly affected parent participation rates in “Other BB” ( $p = .002$ ), but not “Targeted BB” schools ( $p = .661$ ). There was no evidence from the data that area socioeconomic status influenced parent participation rates, with factorial ANOVA revealing

**Table 2** Overall parent participation in Kindytxt (invited versus registered) by recruitment method and area socioeconomic status (low vs high SES)

		Parents						Total
		Recruitment method				Other		
		Case study BB school	Targeted BB school	Other BB school	Sub-total	Non-BB schools	Not specified <sup>a</sup>	
All parents								
Invited (intended sample) <sup>b</sup>	n	413	6139	22,805	29,357	–	–	–
Registered	n	130	250	183	563	9	277	849
Participation rate <sup>c</sup>	%	31.5	4.1	0.8	1.9	–	–	–
Parents—low SES schools <sup>d</sup>								
Invited (intended sample) <sup>b</sup>	n	413	4704	8680	13,797	–	–	–
Registered	n	130	196	52	378	1	92	471
Participation rate <sup>c</sup>	%	31.5	4.2	0.6	2.7	–	–	–
Parents—high SES schools <sup>e</sup>								
Invited (intended sample) <sup>b</sup>	n	–	1435	14,125	15,560	–	–	–
Registered	n	–	54	131	185	8	94	378
Participation rate <sup>c</sup>	%	–	3.8	0.9	1.2	–	–	–

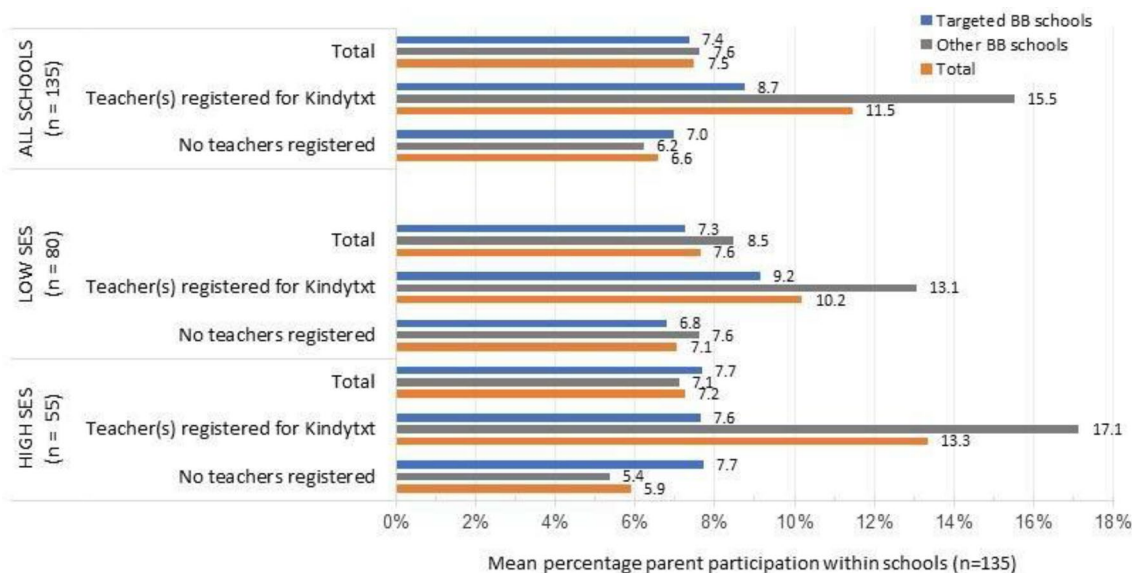
<sup>a</sup>At registration, 277 participants declined to provide their school’s name. Of these, 186 provided a school postcode, thus allowing classification of low versus high SES

<sup>b</sup>Estimated from the number of BB reading packs ordered (i.e., one reading pack per kindergarten child). Assumes one parent potentially registered for Kindytxt per kindergarten child

<sup>c</sup>Only calculable for BB schools where kindergarten class sizes were known. Hence, participation rates exclude the “Non-BB schools” and “Not specified” categories

<sup>d</sup>Parents from schools located in postcode areas below the 50th percentile (deciles 1–5) according to the ABS IRSD

<sup>e</sup>Parents from schools located in postcode areas above the 50th percentile (deciles 6–10) according to the ABS IRSD



**Fig. 1** Within-school parent participation in Kindytxt by area socioeconomic status, teacher participation and school recruitment method (mean percentages)

no significant main effect,  $F(1, 127) = 0.027, p = .869$ ), nor interactions with teacher participation,  $F(1, 127) = 0.270, p = .604$ ), and recruitment method,  $F(1, 127) = 0.107, p = .744$ .

Further evidence about teacher participation was elicited via an SMS feedback question sent to participating teachers at week 10 of the program which asked: “Have you initiated any discussion about the Kindytxt messages with the parents/carers of your kindergarten children?”. The teachers' responses ( $n = 46$ ) illustrate the varying levels of engagement with parents whereby 19 (41.3%) answered positively (“Yes, several times” or “Yes, at least once”), 20 (43.5%) said they had not yet initiated discussion but intended to, and 7 (15.2%) said they would not be discussing the Kindytxt messages with parents.

## RQ2: Kindytxt Attrition

An important feature of the Kindytxt program was that participants could opt out at any time during the 30-week program if they no longer wished to receive the text messages. Since the program content was designed to progress from relatively simple through to more complex literacy practices, patterns of attrition in relation to the program content were of particular interest, as well as any influence of the method of recruitment to the program, area socioeconomic status and teacher participation (Table 3). Given the length of the program, it is heartening that more than 80% of parents remained for its entirety. It is clear, however, that attrition

was most likely to occur during the first 7 weeks of the program where the focus was on shared reading and simple concepts about print.

As might be expected given the additional information and support provided to parents in the case study schools, the attrition rate was lower than for the “Targeted BB” and “Other BB” schools. The Pearson chi-square test of independence showed there was a significant difference on the basis of recruitment method,  $\chi^2(10, n = 563) = 22.93, p = .011$ . However, significance did not hold when the case study schools were removed from the analysis,  $\chi^2(5, n = 433) = 8.70, p = .122$ .

Given the special status of the case study schools, the results for area socioeconomic status and teacher participation in Table 3 are shown with the 130 parents from case study schools removed from the analysis. Pearson chi-square tests showed that for the remaining BB schools, there was no significant difference in the patterns of attrition on the basis of area socioeconomic status,  $\chi^2(5, n = 433) = 9.73, p = .083$ , nor teacher participation,  $\chi^2(5, n = 423) = 2.50, p = .776$ .

We recognise that low attrition does not necessarily equate to high parental engagement with the Kindytxt program. However, evidence of the minimum or “lower limit” of parent engagement is provided by responses to an SMS feedback question sent at week 30 of the program asking parents to indicate their level of agreement with the following statement on a scale of 0 to 10 (where 0 = strongly disagree and 10 = strongly agree): “From the Kindytxt



**Table 3** Percentage of parent attrition from Kindytxt matched to the program content at time of opt-out, by school recruitment method, area socioeconomic status and teacher participation

Kindytxt program content	All BB schools			Targeted+ other BB schools				Total ( <i>n</i> = 849)
	Recruitment method			Area socioeconomic status		Teacher participation?		
	Case study ( <i>n</i> = 130)	Targeted ( <i>n</i> = 250)	Other ( <i>n</i> = 183)	Low <sup>a</sup> ( <i>n</i> = 248)	High <sup>b</sup> ( <i>n</i> = 185)	Yes ( <i>n</i> = 110)	No ( <i>n</i> = 313)	
	%	%	%	%	%	%	%	%
Weeks 1–7: Introduction, book sharing and concepts about print	3.1	10.4	15.8	12.1	13.5	12.7	13.1	9.8
Weeks 8–13: Concepts about print (more complex)	1.5	3.6	2.2	4.0	1.6	1.8	3.5	2.5
Weeks 14–21: Phonological awareness and phonics	0.8	2.8	2.7	1.2	4.9	3.6	2.6	2.1
Weeks 22–25: Oral and aural skills and vocabulary	0.8	0.4	1.1	0.4	1.1	–	1.0	0.8
Weeks 26–29: Letter recognition, letter sounds and letter naming	3.1	0.4	2.7	0.8	2.2	0.9	1.6	1.5
Total attrition <sup>c</sup>	9.2	17.6	24.6	18.5	23.2	19.1	21.7	16.7
Completed program	90.8	82.4	75.4	81.5	76.8	80.9	78.3	83.3

<sup>a</sup>Parents from schools located in postcode areas below the 50th percentile (deciles 1–5) according to the ABS IRSD

<sup>b</sup>Parents from schools located in postcode areas above the 50th percentile (deciles 6–10) according to the ABS IRSD

<sup>c</sup>Total attrition may not have added exactly due to rounding error

program, I have learned new information about reading and speaking with my child”. Responses were received from 309 of the 707 parents who had remained with the program. Of these, almost two-thirds (65.7%) gave high ratings of 8 or above (*Mdn* = 8, *M* = 7.85) and only 14.2% gave ratings of 5 or less. The results of an independent samples *t* test (with equal variances assumed) showed no significant differences between the parents from schools in low (*M* = 7.81) versus high (*M* = 7.94) SES areas,  $t(284) = 0.492, p = .623$ .

## Discussion

### Program Uptake

The results of this study indicate that the integration of Kindytxt into a well-established FLP provides the infrastructure and mechanism for program delivery and facilitates wide distribution. The school participation rates are of particular significance given that schools were the “gateway” to the kindergarten parents for all three program recruitment methods. Thus, the higher uptake of Kindytxt

by schools when recruitment was directly linked to BB (as in the case study and “Targeted BB” schools) suggests that interagency collaboration between schools and local libraries was a key factor in promoting parent/teacher access and participation. Collaboration also provides opportunities for parent involvement in program evaluation and development, building on families' cultural capital through the creation of shared learning spaces in schools and libraries. This adds to research indicating the value of library-school partnerships (Caspé & Lopez, 2018) and the efficacy of recruiting parents through community-based programs (Meuwissen et al., 2017) and established, readily accessible contexts such as schools (Cortes et al., 2021; York et al., 2019).

In terms of parent uptake, the much higher participation rate within the case study schools was most likely attributable to the greater level of direct engagement with parents via information sessions whereby kindergarten teachers, and sometimes also school leaders, were seen to support the program and to actively encourage parents to participate. Among the non-case study schools, parent uptake was higher when teachers also registered and participated in Kindytxt. This was particularly so for “Other BB” schools where Kindytxt flyers were *not* included with BB reading packs and parents were solely reliant on the school to pass

on information about the program, thus potentially concealing or diluting the link between Kindytxt and BB. This suggests teacher participation in “Other BB” schools may be a “proxy” or indicator of the degree to which the Kindytxt program was endorsed and/or promoted to the kindergarten parents.

When asked about their engagement with parents at week 10 of the program, the majority of teachers (85%) indicated that they had engaged or intended to engage with parents about Kindytxt. Although the nature and impact of the discussion between teachers and parents needs further research, our results suggest educator engagement in TMPs may be a key factor in parent uptake and engagement which is consistent with earlier research on the effectiveness of family literacy/outreach programs (Hindman & Morrison, 2011; Padak et al, 2002). While our study further highlights the potential for technology to enhance existing family literacy initiatives (Jimenez et al., 2021; Knight & Hunter, 2013), it also lends support for Cook’s recommendation (2016) that program designers recognise “...human relationships as a more powerful ingredient than technology by itself” (p. 15).

The area socioeconomic status of the participating schools was not found to influence parent uptake of the Kindytxt program. While at least one study has examined the efficacy of targeted versus universal programs (Lese-man & Slot, 2020), findings from the present study add a further dimension to the debate, suggesting that differential approaches to program dissemination may not be necessary in school-based contexts involving educators. Rather, that endorsement of the program by their child’s teacher may be a crucial factor for all parents, regardless of socioeconomic background.

### Program Attrition

Attrition from the Kindytxt program was relatively low and mainly occurred within the first 7 weeks. Socioeconomic status and teacher registration appear to have had little influence on parents withdrawing from Kindytxt once registered. We had anticipated that the more complex letter recognition and naming concepts delivered in weeks 26–29 may have triggered increased opt-outs, but this appears not to be the case. It seems that if parents persevere with the first several weeks of the program then they are likely to complete it.

A range of factors may contribute to the early drop-out rate from Kindytxt that require further investigation. These include alignment of the program content with parent expectations and literacy levels, perceptions about the relative simplicity or difficulty of the activities, and suitability of the time of day that the text messages were

delivered and program language (Cortes et al., 2021; Fricke et al., 2018). Parents who completed the 30 weeks of texts indicated they had gained information about literacy practices. This together with the relatively low attrition rate lends further support for the appropriateness of the model of three texts per week—as developed by ParentPowered (<https://ready4k.parentpowered.com/research.html>) and confirmed by other studies (Cortes et al., 2021; Fricke et al., 2018; York et al., 2019). While the linking of Kindytxt to the BB program was important for recruitment, it did not seem to be a factor in sustaining parent involvement in Kindytxt. Further research is therefore needed to establish the nature and significance of the BB-Kindytxt connection and the outcomes or gains achieved in family literacy practices through the technology-based enhancement of BB.

### Limitations

A limitation of the study is the level of missing data due to participants not being compelled to provide the name of their school. This means that the reported school participation rates and parent participation rates within schools are necessarily an under-representation of the actual program reach. The results relating to attrition need to be treated with caution since, as previously noted, low attrition does not necessarily equate to high engagement with the program.

### Implications and Conclusion

The findings from this study extend current knowledge about how design and delivery components of TMPs influence parent uptake and attrition and have implications for program designers, educators and researchers. Recruitment through schools, collaboration between schools and local libraries, and endorsement and promotion of the program by educators seem to be important factors in its uptake. Program design would benefit from consideration of how to incorporate TMPs into well-established school-based literacy initiatives and promote the direct involvement of educators in promoting and supporting parent uptake and engagement. Further research is needed to ascertain the effectiveness of programs designed for parents living in low socioeconomic communities but delivered universally. The inclusion of implementation/recruitment strategies as a key variable in the evaluation of TMPs would provide further evidence of how different approaches impact program uptake, retention and outcomes.

## Appendix 1

Characteristics of the Kindytxt parent sample derived from information provided at program sign-up ( $n = 849$ )

Sample characteristics	Kindytxt parents		
	n	%	Valid % <sup>a</sup>
Gender			
Female	727	85.6	87.7
Male	100	11.8	12.1
Other	2	0.2	0.2
Not provided	20	2.4	
School recruitment type			
Case study BB school	130	15.3	22.7
Targeted BB school	250	29.4	43.7
Other BB school	183	21.6	32.0
Non-BB school	9	1.1	1.6
Unknown (school name not provided)	277	32.6	
Education region			
Metropolitan	600	70.7	79.2
Regional	158	18.6	20.8
Unknown (school/postcode not provided)	91	10.7	
Area socioeconomic status <sup>a</sup>			
Low	471	7.7	62.1
High	287	4.9	37.9
Unknown (school/postcode not provided)	91	10.7	
School sector			
Government	374	44.1	65.4
Catholic and Independent	198	23.3	34.6
Unknown (school name not provided)	277	32.6	

<sup>a</sup>Missing data excluded from calculations

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## Declarations

**Ethical approval** Approvals for this research were gained from the ECU Human Research Ethics Committee (2020–01945) and the WA Government (D21/0132568) and Catholic (RP2020/45) education systems.

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