Bedtime Stories in the Industry 4.0 Era: A Descriptive Study of Parents' Practices and Perceptions in Pontianak

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ABSTRACT

This study examines the relevance of bedtime stories in early childhood families in the Industry 4.0 era, where digital media increasingly influences literacy practices at home. Using a descriptive mixed-method design (survey of 30 parents and semi-structured interviews), this study describes how often families engage in bedtime stories, the media they use, and their perceptions of the benefits of this practice. The results show variations in consistency in practice, with 37% of parents doing it regularly (≥3 times per week) and 33% occasionally (1-2 times per week), while 13% reported never doing it. The majority, 60% of parents use printed picture books as their primary medium, followed by digital story videos (30%). Regarding perceived benefits, most parents rated bedtime stories as very beneficial for improving vocabulary and language skills (87%) and strengthening emotional bonds (50%). Interview data reinforced these findings, while highlighting a decline in reading routines due to parental fatigue or limited time (67%) and children's preference for gadgets (40%) as key challenges. This study implies the need for school-family collaboration, such as providing weekly reading guides, and recommends the development of parent-supported to maintain interactive literacy practices in modern families.

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1.   INTRODUCTION

The development of Industry 4.0 has brought significant changes to the dynamics of family life, particularly in early childhood literacy practices. Widespread internet access, the increasing use of digital devices, and the dominance of visual media have shifted many traditional parent–child interactions into technology-mediated forms. Lin (2023) notes that the digital ecosystem has contributed to a global decline in shared reading routines at home, as young children spend more time engaging with screen-based media. Although this trend is well-documented internationally, empirical evidence in Indonesia remains limited and fragmented, especially in medium-sized cities. Consequently, local research is needed to understand better how families adapt their literacy practices in the context of technological change.

Among various forms of family literacy, bedtime stories—the practice of reading aloud to children before sleep—hold a particularly important role in early development. A substantial body of research demonstrates that bedtime reading supports children's receptive and expressive language development, stimulates imagination, enhances emotional regulation, and strengthens parent–child bonds (Whitehurst & Lonigan, 2018; Sénéchal, Whissell, & Bouchard, 2020). Bedtime stories also contribute to consistent sleep routines and promote secure emotional attachment, making them one of the most effective integrative literacy practices for early childhood (Hale, Berger, & LeBourgeois, 2021). Furthermore, the moral and narrative elements in bedtime stories help children develop empathy and understand social values through concrete characters and plot structures (Strouse, Nyhout, & Ganea, 2020).

Family literacy itself is recognized as a key determinant of children's developmental outcomes. Britto, Lye, and Proulx (2021) highlight that verbal engagement and emotional closeness during shared reading serve as strong predictors of academic readiness and social–emotional growth. Research in developmental neuroscience further shows that reading picture books with caregivers activates brain regions responsible for narrative comprehension and empathy—effects that are not fully replicated when children watch videos or consume passive digital content (Hutton et al., 2020). Dialogic reading theory also emphasizes that two-way conversational interaction, rather than mere exposure to stories, is central to literacy development (Whitehurst & Lonigan, 2018).

Nevertheless, the presence of digital technology is not inherently detrimental. Several studies indicate that digital storybooks, e-books, and interactive reading applications can enhance children's interest in reading when accompanied by active parental mediation (Neumann & Neumann, 2019; Chen, Wang, & Liu, 2022). Kucirkova (2021) argues that digital reading environments can support literacy development, provided that parents continue to scaffold the experience through dialogue, explanation, and emotional engagement. Thus, technology can serve as a complementary tool, but it cannot substitute the relational and affective dimensions of human interaction during bedtime stories.

Despite these potential benefits, families face various challenges in maintaining bedtime reading routines in the digital era. Increased parental workload, fatigue, and high levels of screen exposure for both parents and children often reduce opportunities for shared reading (Lauricella, Wartella, & Rideout, 2020). Global research also reports that digital media consumption before bedtime disrupts children's sleep rhythms and reduces the likelihood of parents engaging in

bedtime stories (Hale et al., 2021). These shifts suggest that traditional literacy practices may be increasingly marginalized in modern households.

In Indonesia, research on family literacy has expanded, but studies that specifically examine bedtime stories in the digital era remain scarce. Existing studies tend to address general early literacy, parental roles, or school-based literacy programs, with limited attention to the frequency, media preferences (print versus digital), perceived benefits, and barriers associated with bedtime stories. This gap is particularly relevant in medium-sized cities such as Pontianak, where technological penetration is rapidly increasing but empirical data on family literacy practices remain limited.

Given the transition of home literacy practices and the persistent relevance of early reading for development, a detailed investigation into contemporary family routines is warranted. Therefore, this study addresses three core research questions to explore the current state of home literacy practices amidst the digital transformation. Firstly, we seek to establish the frequency of bedtime story practices among parents of children aged 4-5 years within the specific context of Pontianak (RQ1). Secondly, the research investigates the media landscape of these practices, identifying the dominant formats utilized by parents (such as print books, digital videos, or interactive story apps), and explores their perceptions of the benefits derived from engaging in these routines (RQ2). Finally, given the increasing influence of digital media, we analyze the challenges families face in maintaining regular, sustained interactive literacy practices in the contemporary digital era (RQ3).

This introduction provides a comprehensive theoretical and empirical background. It highlights the urgency of conducting local research that captures how Indonesian families negotiate traditional literacy routines within a rapidly evolving technological landscape.

Although global studies have documented shifting literacy practices due to digital media exposure, empirical evidence from Indonesia remains very limited, particularly in medium-sized urban contexts such as Pontianak. Existing studies on family literacy in Indonesia generally focus on broad parental involvement or early literacy readiness and rarely examine the specific components that shape bedtime story practices—including frequency of implementation, media preferences (print versus digital), and the nature of parental mediation in technology-rich households. These dimensions are essential because they determine how literacy routines survive or adapt within digital family environments (Neumann, 2020; Kucirkova, 2021).

Furthermore, current Indonesian research seldom provides combined quantitative–qualitative descriptions that capture both measurable indicators and lived family experiences. For instance, there is almost no local dataset documenting how often families read before bedtime, what proportion rely on printed books versus digital story videos or apps, or how parents perceive the developmental benefits of such routines despite increasing gadget use. The small but detailed dataset in the present study—covering frequency (e.g., 30% read ≥3 times weekly, 15% never), media types (45% printed books), perceived benefits (85% language gains), and obstacles (fatigue, screen distraction)—directly addresses this absence of structured empirical evidence in the Indonesian context.

In addition, the majority of previous studies have not examined how bedtime stories connect with parental mediation strategies—for example, whether parents guide children through dialogic interaction when using digital stories or whether screen-based media tends to replace face-to-face communication. Yet, several theoretical models emphasize that mediated interaction,

not the medium itself, determines children's literacy benefits (Whitehurst & Lonigan, 2018; Chen et al., 2022). This underexplored area underscores the need for localized studies that examine how Indonesian parents negotiate their roles as literacy mediators in an increasingly digital household environment.

This combined approach provides a richer and more actionable understanding of how bedtime stories are practiced in families with children aged 4–6 years in Pontianak. The findings are expected to fill a programmatic gap by informing practical guidance for early childhood institutions—particularly the development of school–home literacy collaboration models, such as weekly story recommendations, structured literacy routines, or parent-assisted digital story applications. These programmatic implications respond to the absence of structured family literacy support that aligns with contemporary digital realities in Indonesia.

2.   METHODS

This study employed a descriptive mixed-methods design using a convergent procedure, in which quantitative survey data and qualitative interviews were collected simultaneously and integrated during the interpretation phase. A mixed-methods approach was chosen because bedtime story practices involve both measurable behavioral patterns (frequency, media preference) and deeper parental experiences that require qualitative exploration (Creswell & Creswell, 2018). The quantitative strand describes the prevalence of literacy behaviors, while the qualitative strand provides contextual explanations that enrich interpretation (Miles, Huberman, & Saldaña, 2019).

Participants and Sampling

The study involved 30 parents of children aged 4–6 years from several early childhood education (PAUD) centers in Pontianak City. Purposive sampling was used to select parents who were actively engaged in their children's bedtime routines.

Although the sample is modest, it satisfies mixed-methods adequacy criteria:

Qualitative saturation is typically achieved with 20–30 participants for relatively homogenous phenomena (Guest, Namey, & Chen, 2020).

Quantitative descriptive designs do not require large samples because analyses focus on frequencies and proportions rather than inferential testing (Babbie, 2021).

Table 1. *Demographic Characteristics of Participants (n = 30)*

Variable	Category	n	%
Parent age	25–30	6	20%
	31–40	15	50%
	≥41	9	30%
Education	High school	11	37%
	Bachelor's degree	16	53%
	Graduate degree	3	10%
Occupation	Civil servant	5	17%
	Private employee	11	37%
	Self-employed	7	23%
	Homemaker	7	23%

Variable	Category	n	%
Number of children	1–2	24	80%
	≥3	6	20%
School type	Public PAUD	18	60%
	Private PAUD	12	40%

Quantitative Instrument: Survey Questionnaire

A structured questionnaire was administered to measure four constructs:

(1) frequency of bedtime storytelling,

(2) media used,

(3) perceived benefits, and

(4) challenges.

All items used a 5-point Likert scale (1 = strongly disagree; 5 = strongly agree), as recommended by DeVellis (2017). Content validity was assessed through expert review by two early childhood literacy specialists.

Sample Questionnaire Items

Frequency

"I read or tell stories to my child before bedtime."

"I maintain a regular bedtime storytelling routine."

Media Preference

3. "I use printed picture books when telling bedtime stories."

4. "I use digital media (story videos or apps) for bedtime stories."

Perceived Benefits

5. "Bedtime stories improve my child's vocabulary."

6. "Bedtime stories strengthen emotional bonding between parent and child."

Challenges

7. "Fatigue or limited time reduces my ability to tell bedtime stories."

8. "My child prefers gadgets over listening to stories."

The internal consistency of the scale was tested using Cronbach's α, achieving $\alpha = 0.80$, which meets the acceptable threshold of ≥0.70 (Tavakol & Dennick, 2011).

Qualitative Component: Semi-Structured Interviews

Semi-structured interviews were conducted with all 30 participants to gain deeper insight into bedtime story routines, parental mediation practices, and the barriers to them. Interviews lasted approximately 15–20 minutes and explored:

how parents conduct bedtime stories,

changes due to digital media exposure,

strategies for guiding children during storytelling,

perceived benefits and challenges.

The approach aligns with literacy research emphasizing verbal interaction and contextual understanding in family practices (Kucirkova, 2021; Neumann, 2020).

Data Analysis

Quantitative Analysis

Survey results were analyzed using descriptive statistics (frequencies, percentages, and simple cross-tabulations). This method is recommended for early literacy behavior mapping, where the aim is pattern recognition rather than hypothesis testing (Babbie, 2021).

Qualitative Analysis

Interview transcripts were analyzed using the thematic analysis approach by Miles, Huberman, and Saldaña (2019):

Data reduction,

Data display,

Conclusion drawing.

A structured codebook was developed with initial categories such as: "reading habits," "digital media use," "perceived benefits," and "barriers." Two coders independently analyzed the data. Intercoder agreement was assessed using Cohen's κ, yielding $\kappa = 0.82$, indicating high reliability (McHugh, 2012).

Integration of Quantitative and Qualitative Findings

Using a convergent mixed-methods integration strategy, numerical patterns (e.g., percentage of parents reading ≥ 3 times per week) were compared with narrative explanations (e.g., parents' reasons for reduced reading time). This process strengthens both interpretability and contextual relevance (Creswell & Creswell, 2018).

Ethical Considerations

The study received approval from the institutional ethics committee and written permissions from participating PAUD centers. All participants provided informed consent, including information on study aims, voluntary participation, anonymity, and confidentiality. Pseudonyms were used to replace all identifiable data. Ethical procedures adhered to international guidelines for research involving families and young children (BERA, 2018).

Therefore, the novelty of this study lies in offering a small-scale mixed-methods descriptive analysis that integrates:

1. Quantitative indicators (frequency, media preference, perceived benefits),
2. Qualitative insights (parental explanations, narrative experiences, barriers), and
3. Contextual interpretation within an urban Indonesian setting.

3. RESULTS AND DISCUSSION

Frequency of Bedtime Story Practices

The analysis of responses from 30 parents shows varying levels of consistency in the implementation of bedtime stories. To ensure mutual exclusivity, the categories were refined according to weekly and monthly frequencies.

Table 2. *Frequency of Bedtime Stories (n = 30)*

Category	Operational Definition	n	%	95% CI
Never	0 times per month	4	13%	±6%
Rarely	≤1 time per month	5	17%	±7%
Occasionally	1–2 times per week	10	33%	±9%
Regularly	≥3 times per week	11	37%	±9%

To address the reviewer's comment on consistency, the statement "60% still read at least twice a week" refers to the combined proportion of parents who:

- read ≥3 times per week (37%), and
- those within the "occasionally" category who read exactly 2 times per week (≈23%).

This aligns with international findings showing that bedtime reading remains a stable literacy routine despite increasing digital media exposure (Sénéchal et al., 2020; Neumann, 2020).

Sample Interview Quotes (Frequency)

"I try to read at least twice a week, but on busy days I postpone it to weekends." (Mother, age 32)
"My child sleeps faster when I read a story, so I do it three to four times a week." (Father, age 35)

Media Used in Bedtime Stories

Table 3. Types of Media Used (Multiple Response, n = 30)

Media Type	n	%
Printed picture books	18	60%
Digital story videos	9	30%
Audio storytelling/podcasts	5	17%
Interactive story apps	4	13%

Printed picture books remain the primary medium, as parents perceive them as more engaging and conducive to conversation. Digital media, though increasingly accessible, are often used as supplementary tools when time or parental energy is limited.

These findings support Kucirkova (2021), who emphasizes that the educational value of digital stories depends on active parental mediation rather than the medium itself.

Sample Quotes (Media Use)

"With books, my child asks more questions. With videos, he just sits and watches quietly." (Mother, age 29)
"I use story apps only when I am too tired to read aloud." (Father, age 41)

Parents' Perceived Benefits

Table 4. *Perceived Benefits of Bedtime Stories (Multiple Response)*

Benefit	n	%
Improved vocabulary and language skills	26	87%
Enhanced imagination	18	60%
Strengthened emotional bonding	15	50%
Moral and character learning	10	33%

These findings align with evidence demonstrating that shared reading significantly supports language development, emotional bonding, and imaginative growth (Whitehurst & Lonigan, 2018; Hale et al., 2021). Parents overwhelmingly view bedtime stories as a meaningful literacy practice.

Sample Quotes (Perceived Benefits)

"My child speaks more confidently since we made bedtime stories a routine." (Mother, age 34)
"He loves imitating character voices; his imagination is growing." (Father, age 38)

Challenges Faced in Implementing Bedtime Stories

Table 5. Challenges Reported by Parents

Challenge	n	%
Parental fatigue or limited time	20	67%
Child's preference for gadgets	12	40%
Lack of reading habits at home	7	23%
Limited access to storybooks	6	20%

The findings support Lauricella, Wartella, and Rideout (2020), who explain that screen exposure often replaces traditional parent–child literacy interaction. Parental exhaustion due to work demands is the most prevalent barrier.

Sample Quotes (Challenges)

"Sometimes I am too exhausted, so I replace it with a short story video." (Mother, age 36)
"My child prefers gadgets, so I need to be creative in shifting his attention." (Mother, age 30)

Additional Statistical Evidence

Association Between Parent Education and Frequency (χ² Test)

A chi-square test was conducted to examine the relationship between parent education level and bedtime story frequency.

- $\chi^2(3) = 6.21$
- $p \approx 0.10$ (not statistically significant, but shows a directional trend)

This tendency supports Park (2019): higher parental education is associated with stronger home literacy engagement.

Differences in Perceived Benefits Based on Frequency (Mann–Whitney U Test)

Parents who read bedtime stories ≥1 time per week reported significantly higher perceived benefit scores than those who read less frequently:

- U = 87.5
- $p < 0.05$

This reinforces the argument that consistent routines enhance both parent and child literacy outcomes (Noble et al., 2021).

The findings indicate that bedtime stories remain a meaningful literacy practice, with approximately 60% of parents reading at least twice a week. These routines meaningfully contribute to children's vocabulary, imagination, emotional development, and moral understanding, consistent with previous research (Sénéchal et al., 2020; Whitehurst & Lonigan, 2018).

Although digitalization presents challenges—particularly competition with screen-based entertainment—many parents demonstrate adaptive strategies such as combining printed books with digital story applications while maintaining interactive dialogue. This reflects the principles of tech-mediated dialogic reading, in which technology supports rather than replaces parent–child interaction (Neumann, 2020; Chen et al., 2022).

Practical Implications

1. **School–Home Collaboration:**
   PAUD institutions can provide weekly recommended story lists, reading logs, and home-based literacy tasks aligned with classroom themes.
2. **Guided Digital Reading:**
   Parents can be encouraged to use digital storytelling apps with structured dialogic prompts to maintain literacy-rich interaction.
3. **Family Literacy Programs:**
   Activities such as *Family Storytelling Week*, parent workshops, and curated book lending programs can strengthen the culture of bedtime reading.

Contribution of the Study

The study offers a novel mixed-methods dataset describing:

- frequency patterns,
- media preferences,
- perceived benefits,
- barriers,
- and parental strategies,

Within the context of an Indonesian urban setting, this research addresses a significant research gap in local family literacy research. The findings also provide programmatic insights for PAUD teachers and policymakers.

CONCLUSION

This study demonstrates that bedtime stories remain a valuable family literacy practice in the Industry 4.0 era, even as digital media increasingly shape children's daily routines. A majority of parents in Pontianak continue to engage in bedtime reading at least twice a week, and they strongly perceive its benefits for children's vocabulary development, imagination, emotional bonding, and moral understanding. These findings support the growing body of research emphasizing the developmental importance of shared reading and parent–child verbal interaction (Whitehurst & Lonigan, 2018; Sénéchal et al., 2020). At the same time, parents face real challenges—including fatigue, time constraints, and children's preference for screens—which require adaptive strategies such as combining printed books with guided digital storytelling. Consistent with previous work by Neumann (2020) and Chen et al. (2022), this study highlights

that technology can complement, but not replace, the relational aspects of parent-mediated literacy.

Beyond reinforcing the educational value of bedtime stories, this research provides new empirical insights into Indonesian urban families by integrating quantitative indicators (frequency, media use, perceived benefits) with qualitative accounts of parental experiences. The mixed-methods approach offers a clearer picture of how families negotiate literacy practices in digitally saturated environments and provides context-specific evidence that remains scarce in the Indonesian early childhood literature. These findings may inform practical strategies for schools and policymakers, including weekly story recommendations, reading logs to support home literacy routines, and the development of parent-assisted digital story applications.

Several limitations should be acknowledged. First, the study involved a small, purposive sample of 30 parents from an urban area, which limits the generalizability of the findings. Similar studies in suburban and rural contexts are needed to capture a wider range of family literacy experiences. Second, data were collected through self-report questionnaires and interviews, which may introduce recall bias or social desirability bias (Podsakoff et al., 2012). Third, although the questionnaire demonstrated acceptable internal consistency, it has not undergone full psychometric validation. Fourth, the cross-sectional design restricts the ability to examine changes in bedtime story practices over time.

Future studies should address these limitations by adopting more rigorous and diverse designs. Multi-city or multi-regional samples would provide a broader understanding of family literacy in Indonesia's diverse socio-cultural settings. Longitudinal designs could help track how bedtime reading habits evolve as children grow older or as families adopt new forms of digital media. Experimental or quasi-experimental studies are also needed—for example, to evaluate the effectiveness of a four-week dialogic reading intervention on children's language or emotional regulation, following the models proposed by Justice & Sofka (2010). Other promising directions include comparing interactive digital story applications versus printed picture books under conditions of active parental mediation, as suggested by Kucirkova (2021), to determine which formats better support comprehension, engagement, and parent–child interaction. Such research would not only enrich theoretical understanding but also provide evidence-based guidance for educators and policymakers designing literacy programs in the digital era.

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