

The Impact of Digital Media Use on Home Reading Environments of Early Primary School Students

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Abstract: The home literacy environment (HLE) is one of the most widely reported predictors of early literacy development and refers to the availability of print resources, the frequency of sharing reading experiences between parents and children and parents' attitudes toward reading. The fast penetration of the digital media into family life has brought new factors that interact with, reconstruct and in some ways threaten the old HLE. The review explores the impact of using digital media on the HLE of children in early primary school (grades 1–3, aged 6–9) from three theoretical perspectives: Bronfenbrenner's ecological system model; the multidimensional concept of HLE; and the hypotheses of displacement and complementarity of digital media effects on literacy-relevant family activities. Longitudinal, experimental and cross-sectional studies suggest that passive screen time displaces parent-child shared reading time and relates negatively to early literacy outcomes, while interactive digital reading tools, e.g., e-books with dialogic features, educational audiobooks and literacy applications, can enhance HLE when used with active parental mediation. Parental media literacy and family socioeconomic status (SES) are the key predictors of HLE, depending on whether digital media use contributes to or hinders HLE. The report concludes with some pragmatic suggestions for parents, educators and policymakers towards the creation of digitally connected HLEs that retain the relational and linguistic elements of traditional shared reading.

Keywords: Home Reading Environment, Digital Media, Early Primary School, Shared Reading, Displacement Hypothesis, Parental Mediation, E-Books, Media Literacy, Socioeconomic Status, Early Literacy.

1. Introduction

1.1. Research Background

The home reading environment is a major predictor of children's language and literacy development. The pioneering work of Bus, van IJzendoorn and Pellegrini who conducted a meta-analysis in 1995, quantified the strong association between parent-child book reading and children's language skills. Children from homes with high exposure to print, regular shared reading practices, and positive parental attitudes toward literacy consistently outperform children from literacy-poor home environments on measures of phonological awareness, vocabulary, reading comprehension, and reading motivation. HLE is particularly crucial for children in the early grades of primary school (Grades 1–3), when children are in the transition from learning-to-read to reading-to-learn and when home literacy practice constitutes a high proportion of total literacy learning time.

Digital media also have affected the character of children's home environments and their influence on family life. In OECD countries, children aged 5-8 spend an average of two to four hours a day in front of screens, a considerable amount of time that detracts from time that might have been spent on conventional literacy activities like collaborative reading, independent print reading and oral storytelling. But digital media also provides new resources for literacy – e-books, audio book platforms and literacy apps – that are not necessarily negative in their impact on HLE and whose effects are critically dependent on the mode of use, the level of parental mediation and the socio-economic context of the family. The primary difficulty for HLE research in the digital age is to theoretically and empirically disentangle these complex impacts.

1.2. Research Questions

This review answers three research questions. RQ1: How does the use of digital media affect three core characteristics of the HLE in early primary school families, namely print resource availability, parent-child shared reading, and parental literacy attitudes? What are the mechanisms? RQ2: How do parental media literacy and family SES play in regulating the impact of digital media use on the HLE? RQ3: What are the best and feasible approaches to create digitally integrated HLEs that enhance early literacy development?

2. Theoretical Framework

2.1. Bronfenbrenner's Ecological Systems Model

Bronfenbrenner's [11] ecological systems model of nested, multi-level environmental phenomena provides a theoretical basis for understanding the impact of digital media on the HLE. The applicability of the model for HLE research was shown in the seminal study by Bus et al. in which the microsystem-level mechanisms by which collaborative reading generates intergenerational literacy transfer were described [1]. The paradigm situates child development in five concentric systems, the microsystem, mesosystem, exosystem, macrosystem, and chronosystem, which in bidirectional ways shape developmental outcomes. The family home is the child's primary microsystem, the immediate environment of face-to-face relationships, activities, and social roles that most directly influences development. Digital media devices are structural parts of this microsystem, as resources of entertainment, instructional tools and communication platforms whose presence and

usage patterns modify the relational dynamics and activity structures of the home environment. The digital age also brings an important theoretical addition: the idea of the virtual microsystem. This refers to the digital contexts in which children and parents participate and which, while not physically co-present, directly affect the values and connections of the physical microsystem.

2.2. The Multidimensional Home Reading Environment Construct

The HLE is a multidimensional construct with three analytically distinct but empirically related components: (1) the material dimension (amount and variety of print resources available in the home); (2) the interactive dimension (frequency, duration and quality of parent-child shared reading interactions); and (3) the attitudinal dimension (parental beliefs about the importance of reading and affective quality of literacy interactions). From a study of HLE dimensions and vocabulary size, results suggest that the interactive and attitudinal dimensions, not just material provision, are main drivers of literacy-relevant developmental outcomes and that the quality of joint engagement mediates the HLE-vocabulary link [2]. The 3D model is utilised as an evaluative framework to investigate the differential effect of digital media on the HLE components. Therefore, the role of digital media in the HLE needs to be understood in all three dimensions. The impacts on the material dimension with e-books as complements or substitutes to print books; the effects on the interaction dimension with the displacement or enrichment of shared reading; and the effects on the attitudinal dimension with parental opinions on the value of digital reading.

2.3. The Displacement Hypothesis and Complementarity Pathway

The displacement hypothesis suggests digital screen media use displaces activities that are related to literacy, due to consumption of finite time resources. As children spend more time with screens, there is less shared reading, print reading, and oral language interactions, and negative associations between screen time and literacy outcomes. The OECD [3] explicitly advocates displacement in its 2025 research. Longitudinal studies have shown considerable drops in the frequency of parents reading to their child for each additional hour of passive screen usage [4]. The complementarity pathway makes a different prediction: interactive digital reading tools, when used alongside active parental mediation, can complement and enrich the HLE by providing access to literary resources that may have previously been unavailable, scaffolding engagement through adaptive features, and shared reading interactions that are comparable with print book reading. Empirical evidence supports a conditional model: the displacement hypothesis is most strongly supported for passive, entertainment-oriented screen use whereas the complementarity pathway characterises interactive digital reading with parental co-engagement.

3. Impact Domains

3.1. Digital Media and Parent-Child Shared Reading

One of the most consistent findings in the HLE-digital media literature is a relationship between passive screen time and the frequency of parent-child shared book reading. The

isotemporal replacement analysis indicates that substituting passive screen time with collaborative reading is associated with statistically significant and noticeable gains in early literacy outcomes, providing some causal evidence in favour of the displacement hypothesis [5]. Inverse associations of daily screen time with frequency of shared reading were supported by longitudinal studies, with a specific role of television and video use [4]. There are several mechanisms at play: background television reduces the quantity and quality of verbal interactions between parents and children; parental smartphone use during shared reading reduces parental responsiveness and verbal elaboration; and high-engagement entertainment media compete with reading for children's voluntary allocation of time.

Digital storybooks are a different kettle of fish. A thorough examination of collaborative reading of e-books and paper books reveals that involvement differs between media based on digital book features and reading context [9]. Print books constantly produce higher verbal interactions and joint building of meaning, while e-books with built-in narrative are likely distracting in terms of dialogic engagement and restricting parental elaboration practices [9]. The results suggest that the format of digital reading interactions, rather than the digital medium itself, is the most important predictor of quality of shared reading.

3.2. Digital Media and Children's Reading Motivation and Attitudes

Direct and indirect associations between children's reading motivation and digital media use. The direct positive path is via motivated engagement: interactive literacy programs with game-like features and personalised difficulty modification have been shown to boost children's voluntary involvement in reading-like activities. For young primary school children still developing reading automaticity and relying on intrinsic motivation to sustain the effortful practice required to consolidate skills, however, there is a substantial risk in the indirect negative pathway where high-stimulation digital entertainment raises children's arousal thresholds, making print reading comparatively less rewarding. A comparative study of digital and print reading with 202 children in early primary grades finds that adult-accompanied digital reading has engagement profiles more similar to print reading than unaccompanied digital reading, and that a co-reading adult significantly reduces engagement with distracting enhancement features. [10] These present findings suggest that parental co-engagement is the major behavioural predictor for the positive or negative influence of digital reading technologies on literacy-relevant attitudinal development.

3.3. Digital Reading Tools and the Reconstruction of the HLE

With the emergence of e-books, audiobooks and educational literacy applications, the HLE is being actively reconstructed, affecting the forms of literary encounter, modalities of shared reading involvement and the spatial and temporal framing of family reading practice. One study on shared digital storybook reading from the perspective of parents reported that parents perceived digital storybooks as portable, available in multiple languages, and interactive, but also expressed concerns about distraction and the lack of physical book handling experiences [9]. If e-books replace physical book collections instead of augmenting them, the

material HLE dimension is enriched in breadth but perhaps impoverished in depth. Children's print concept development, spatial text navigation skills, and haptic book-handling experiences depend on physical engagement that digital interfaces cannot replicate. Audiobooks are a particularly important digital resource for early primary school children whose decoding automaticity lags behind their listening comprehension (a common developmental profile in Grades 1–2) and thus provides access to vocabulary and narrative complexity that the child cannot yet access through independent print reading [12].

4. Moderating Variables: Parental Media Literacy and Socioeconomic Status

4.1. Parental Media Literacy as a Primary Moderator

The impact of digital media on the HLE is most strongly determined by parental media literacy (knowledge of developmental repercussions of digital media, abilities to evaluate digital reading materials and the ability to practise active mediation). One study on parental media literacy and the quality of preschool children's learning found that media literacy improved outcomes through democratic parenting, with the strongest effect in high screen exposure conditions [6]. Media-literate parents are more prone to choose evidence-based literacy applications, engage in dialogic reading during shared e-book reading, put limits on entertainment media, and model goal-directed reading behaviours [6][12]. This competency profile aligns directly with the parent behaviours associated with high quality print-based shared reading: strategic questioning, narrative elaboration and affective engagement. This suggests that media literacy training could be integrated into broader parent literacy development programs.

4.2. Socioeconomic Status and the Digital HLE Divide

Family SES impacts the digital HLE through numerous interacting paths. A structural equation modelling analysis reveals that SES has a strong direct effect on early digital literacy ($\beta = 0.102$, $p < 0.01$) and is mediated in parallel by HDR ($\beta = 0.285$, $p < 0.001$) and parental mediation ($\beta = 0.290$, $p < 0.001$) [7]. HLE quality is positively connected with early literacy results across its dimensions: Higher-SES families provide more extensive print and digital resource settings, use more active and informed parental mediation, and adopt more literacy-supportive attitudes. A study on digital parenting in rural China indicates that low SES is substantially associated with permissive digital parenting, making SES a structural factor for HLE quality beyond resource access [8].

5. Discussion: Practical Pathways for Optimising the Digital HLE

The reviewed evidence converges into a practical model for improving the digital HLE, addressing each of the research issues. In response to RQ1, digital media influence is through the displacement of shared reading time by passive screen use, the increase of literacy resource availability by quality digital reading tools, and the modulation of parental literacy attitudes by digital reading experiences. RQ2: Parental media literacy is the strongest mediator. SES is the structural driver of

resource availability and quality of mediation. RQ3. Support was strongest for three tactics. First, families must guard against passive entertainment media displacing a dedicated daily shared reading time [5]. Second, parental literacy programs should support parents in developing digital reading mediation skills, such as selecting high-quality digital reading resources and engaging in dialogic shared e-book reading [6]. Third, policymakers and educators may reduce the SES-mediated digital HLE gap by providing curated digital literacy libraries and parental digital literacy training in targeted ways [7][8].

6. Conclusion

The review reveals that the way digital media is consumed, the amount and quality of parental mediation and the socioeconomic position of the family all have a significant role in the effect of digital media on the home reading environment of young primary school kids. The most strongly associated HLE dimension with early literacy outcomes is substituted for by passive entertainment-oriented screen time as a substitute for parent-child shared reading, whereas interactive digital reading tools with active parental co-engagement are a complementing resource that strengthens the HLE. The individual element that determines whether the use of digital media is an assist or a hindrance to literacy development is parental media literacy. SES is the structural factor that conditions access to great digital resources and parental abilities to use them successfully. For families, schools and policy systems seeking to support early literacy in the digital age, the practical imperative is to create digitally integrated HLEs that preserve the relational, dialogic and affective qualities of traditional shared reading while capitalising on the access and engagement affordances of digital reading tools.

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