Educational Research for Policy and Practice
https://doi.org/10.1007/s10671-026-09417-1

ORIGINAL ARTICLE

Opportunities and challenges in reading literacy development in a digital context: preservice teachers

Sonja Rutar[1] · **Barbara Baloh**[1]

Received: 1 September 2025 / Accepted: 3 February 2026

Abstract
The development of reading literacy in the contemporary context, characterised by the predominance of digital technology, poses a significant pedagogical challenge. In the Slovenian higher education system, future preschool and primary school teachers are educated at the Faculty of Education, which enables developmental continuity in pedagogical approaches from kindergarten to primary school. This article reports the findings of a study involving prospective preschool and primary school teachers who participated in projects designed to cultivate digital literacy to enhance teaching efficacy through the use of digital technology. The study employed a qualitative approach. In the first phase, students reflected on their individual trajectories of reading literacy development. In the second phase, participants considered the advantages and disadvantages of developing reading literacy through digital technology, drawing on their personal experiences of learning to read and of using digital tools in pedagogical contexts.

Keywords Literacy · Digital technology in education · Preschool · Primary school

1 Introduction

Slovenia devotes considerable attention to the development of reading literacy at all levels of education and in adulthood. Over the past decade, national development and research efforts have focused on the systematic strengthening of interdisciplinary cooperation among kindergartens, schools, and universities; the promotion of reading culture within families (both in kindergartens and at home); and the development and support of strategies at the national level. In December 2019, the government of the Republic of Slovenia adopted the *National Strategy for the Development of Reading Literacy for the Period 2019–2030* (Požar Matijašič, 2023), thereby establishing a framework for coordinated action. The strat-

✉ Sonja Rutar
sonja.rutar@pef.upr.si

Barbara Baloh
barbara.baloh@pef.upr.si

[1] Faculty of Education, University of Primorska, Koper, Slovenia

Published online: 03 March 2026

egy also enabled the creation of the National Council for Reading Literacy, tasked with overseeing its implementation.

At the same time, Slovenia participates in international monitoring of reading literacy through Progress in International Reading Literacy Study (PIRLS), Programme for International Student Assessment (PISA) and Programme for the International Assessment of Adult Competencies (PIAAC). In PIRLS, Slovenia achieved steadily improving results between 2001 and 2016. In PISA 2015, Slovenia scored 505 points in reading literacy—its best result to date and above the Organisation for Economic Co-operation and Development (OECD) average of 490. In PISA 2018, the score declined to 495 points but remained above the average. In PISA 2022, however, there was a further decline to 469 points, the lowest value to date and below the OECD average (476) (Šterman Ivančič & Mlekuž, 2023).

Initial literacy acquisition in the Slovenian school system is grounded in a communicative approach that integrates reading, writing, listening, and speaking in their traditional forms. Didactic recommendations support language development already in the pre-literacy period, the use of analytical–synthetic methods combining auditory and visual exercises, the global recognition of frequent words, and multisensory support. The components of reading literacy (*Gradniki bralne pismenosti*) have also been systematised (Haramija, 2020).

Traditional reading instruction is based on linear engagement with printed materials, in which readers rely on spatial, tactile, and visual cues such as turning pages and perceiving the structure of the text. Teaching involves the gradual development of basic reading skills—recognising graphemes and phonemes, forming words, and understanding sentences and longer passages—alongside the introduction of deep-reading strategies such as prediction, summarisation, inference, and critical evaluation. This approach promotes sustained attention, repeated reading, and reflective engagement with content.

The transition to digital media is reshaping established reading strategies, particularly for readers who learned to read in traditional, linear contexts. Digital texts provide rapid access to additional resources, dictionaries, and online discussions and encourage non-linear information seeking, thereby increasing the flexibility and interactivity of reading. However, the abundance of hyperlinks, images, and animations, the limitations of screen display, and the absence of spatial and physical landmarks can hinder text organisation, memorisation, and reflection. The literature (Kreuh, 2014; Spitzer, 2016, 2021; Tancig, 2016; Wolf, 2018) indicates that traditional forms of reading instruction foster deep understanding, whereas digital reading offers greater flexibility and accessibility but may lead to cognitive overload and reduced comprehension if appropriate strategies are not developed.

Ensuring the effective use of digital technology in the development of reading literacy requires not only access to technological tools but, above all, teachers' knowledge of how to employ them for didactic purposes (Ertmer et al., 2010). Research shows that teacher candidates can move beyond using digital tools merely to increase motivation and instead adopt technologies in ways that serve clearly defined, literacy-related instructional goals (Wake & Whittingham, 2013). The manner and extent of digital integration are also shaped by the beliefs and attitudes of both prospective and practicing teachers (Fälth & Selenius, 2024; Tondeur et al., 2017). Teachers' conceptions of their professional role and their visions of effective pedagogical practice serve as key reference points that influence instructional choices, classroom practices, and professional development trajectories (Korthagen, 2017).

Together, these policy commitments, assessment results, and instructional traditions situate reading literacy in Slovenia as a historically strong, predominantly print-based

educational culture that is now encountering a significant transformation through digitalisation—creating a productive tension between established deep-reading practices and emerging digital forms of literacy, which the present study seeks to explore through the perspectives of future teachers.

This article presents findings from a study conducted in Slovenia with future preschool and primary school teachers who participated in project-based activities focused on the use of digital technology in early literacy education. Through these projects, participants gained direct insight into both the opportunities and challenges associated with integrating digital tools into literacy instruction. As most participants learned to read during early childhood in educational contexts characterised by minimal use of digital technology, the study places particular emphasis on their personal reflections on past literacy experiences and contemporary digital learning environments.

The study explores how these future teachers evaluate the educational potential of digital technology in early literacy development through the lens of their own learning trajectories. By drawing on participants' lived experiences, the research aims to identify perceived benefits, limitations, and conditions for the meaningful integration of digital tools into early reading instruction. In doing so, it contributes to the development of pedagogically grounded approaches to educational technology informed by authentic reflection and by the professional perspectives of future teachers—individuals who are both competent users of digital technologies and experienced learners from less digitally intensive educational contexts.

The study thus supports ongoing efforts to integrate digital technology in preschool and primary education in ways that enhance reading literacy while remaining sensitive to children's learning and developmental needs.

1.1 Efforts to ensure a high level of reading literacy in Slovenia

Recent research in Slovenia has focused on defining reading culture and its elements, examining when reading becomes a value, and identifying psychological obstacles to its development (Pečjak, 2021). Other studies have explored the role of reading motivation in pupils' achievement (Pečjak et al., 2024), the function of storytelling in the literacy process (Baloh, 2015), and the importance of systematic vocabulary development—both incidental and planned activities—across school subjects to improve reading comprehension (Vrhovec & Soršak, 2024).

At the preschool level, the positive effects of additional programmes addressing graphomotor skills, metalinguistic awareness, and storytelling on later literacy outcomes have been demonstrated (Marjanovič Umek et al., 2019a). These findings underscore the need for systematic, planned, and structured educational work aimed at developing pre-literacy skills in early childhood.

In recent years, Slovenian research and development projects have also examined the role of the family environment in literacy development and its supportive function in early reading. Marjanovič Umek et al. (2019b) analysed the relations among the quality of mother–child shared reading, children's storytelling abilities, and the family literacy environment. They found that higher shared reading quality was associated with greater coherence in children's narratives and with a more supportive home literacy environment. These results highlight the importance of shared reading for the development of child's storytelling and early literacy skills.

In a comparative review entitled *The Impact of Home Environment Support on Reading Achievement Based on PIRLS 2021 Results*, Kjeldsen and Perović (2025) found that the difference in reading achievement between students who were often or sometimes involved in early reading activities with their parents is relatively small. They suggested that schools in Slovenia most likely compensate to a greater extent for exogenous factors related to family activities prior to schooling, thereby contributing to greater equality among students from different backgrounds. At the same time, they found that participation in early reading activities before primary school has a significant positive effect on reading achievement, particularly among lower-achieving pupils, indicating that early support for reading can help mitigate later disparities in outcomes. They also emphasised that parents' attitudes towards reading vary according to achievement level: lower-achieving students benefit more from positive parental reading behaviour than higher-achieving students. On this basis, they concluded that creating a positive reading environment at home may represent a key mechanism of support, especially for students who face challenges in reading (p. 148).

Various projects have also been organised in Slovenia with the aim of promoting family literacy, including the *Program for the Promotion of Family Literacy in Pre-school Age: In the Embrace of Words* (2016–2017). A National Network for Literacy and Reading Culture has also been established, bringing together various stakeholders in the field of literacy and reading culture. These initiatives involve higher education institutions, research organisations, public libraries, schools, and kindergartens, with the aim of increasing reading motivation, parental involvement, and the development of early literacy and reading culture within the family. A national study entitled *Reading Patterns: Reading Habits of Professionals in Kindergartens*, *Schools*, *Faculties*, *and General Libraries* (2023–2025) is currently underway. This study examines the reading habits of preschool and primary school teachers at all levels of education, based on the assumption that teachers' reading habits implicitly shape how reading is taught (McKool & Gespass, 2009; Wijayanti et al., 2022).

Although projects and research in Slovenia have primarily focused on improving traditional reading literacy, in recent years future preschool and primary school teachers have also been involved in initiatives aimed at developing digital literacy and integrating digital technologies into reading and literacy development processes (e.g. the project *Developing Reading Skills With and Through Digital Technologies—eRead*, 2022–2025).

In line with evolving conceptions on texts, there is a growing need to redefine reading literacy beyond the traditional understanding of linear, single-mode texts. Kreuh (2014) noted that contemporary texts frequently take the form of multimedia or hybrid compositions, representing a substantial shift in reading strategies. Similarly, from a modern communication perspective, Starc (2011, 2024) highlighted the necessity of developing multiliteracy, as understood by Halliday (1977) and the New London Group (1996), which focuses on making meaning through the use of different semiotic sources alongside language in so-called multimodal texts. Meaning is thus construed as the interaction of all semiotic resources used, taking into account different modes of expression and different media. Drawing on Halliday (1977), Starc (2011, 2024) claims that every text is a phenomenon of communication.

Research further indicates that the integration of digital tools with effective teaching strategies can significantly enhance access to educational resources and reduce learning inequalities. By facilitating access to diverse forms of knowledge, digital technologies can support more inclusive learning opportunities, particularly for learners with limited cultural capital. In this way, they have the potential to contribute to the democratisation of access to

knowledge. However, this potential is contingent upon the development of adequate digital literacy skills and the provision of appropriate pedagogical support (European Commission, 2025; Flanagin & Metzger, 2007; OECD, 2021; Selwyn, 2016; UNESCO, 2022). These findings underscore that access to digital tools alone does not guarantee equal educational opportunities unless it is accompanied by thoughtful pedagogical guidance.

Against this backdrop, the present study explores the perceptions of prospective preschool and primary school teachers regarding the role of digital technology in the development of reading literacy. Specifically, it examines how participants reflect on their own literacy acquisition experiences and how they evaluate the opportunities and challenges of integrating digital tools into early literacy instruction, based on their engagement in higher education projects aimed at fostering digital teaching competencies.

Set against a longstanding tradition of linear, print-based literacy practices and the rapid emergence of multimodal, digitally mediated forms of reading, the present study is situated at the intersection of continuity and change in literacy education. The study addresses the following research questions:

1. Which factors do prospective preschool and primary school teachers perceive as most important and effective in their literacy development?
2. Which factors do they perceive as the most supportive during their literacy development, particularly in relation to the roles of family, educational institutions, and learning environments?
3. What opportunities do future teachers identify in the use of digital technologies for supporting early reading development?
4. What challenges do they perceive in relation to the integration of digital technologies into early literacy development?

The aim is to capture participants' perspectives on both traditional and digital dimensions of literacy development as well as the perceived benefits and constraints of integrating digital tools into early reading instruction.

2 Methodology and research design

The study employed a descriptive educational research model, utilising a qualitative approach to data collection and analysis. This methodology enabled an in-depth exploration of participants' experiences, beliefs, and reflections on literacy development and the integration of digital technology. Specifically, a reflective narrative approach was utilised to explore personal experiences through autobiographical exploration (du Preez, 2008).

2.1 Participants

The study involved 73 undergraduate students, including 30 future preschool teachers and 43 future primary school teachers. All participants had prior experience in using digital technologies to support early literacy development and were actively engaged in higher education programmes that include projects aimed at developing digital competencies for technology-enhanced teaching. Their involvement in these initiatives provided a relevant

and insightful basis for investigating their reflections on different approaches to literacy development and for evaluating the potential and limitations of integrating digital technologies into early reading literacy development.

2.2 Data collection

Data were collected using a qualitative survey instrument developed in 1KA, an open-source platform for online survey administration that ensures complete participant anonymity. The questionnaire was administered as part of a broader research project examining factors that contribute to the effectiveness of reading instruction in the first and second language, using both traditional and digital approaches. For the purposes of this article, only findings related to the development of early literacy in the first language are presented. The survey was conducted in accordance with the ethical principles of research at the University of Primorska, and all data were stored and processed in compliance with personal data protection legislation.

The survey was designed to elicit rich and reflective responses. The findings presented here derive from open-ended questions that encouraged participants to articulate their experiences and perspectives in depth.

In the first phase, participants were invited to reflect on their personal trajectories of literacy development. In the second phase, the study explored their perceptions of the advantages and challenges of literacy development supported by digital technologies, drawing on both personal experience and emerging professional practice.

The questionnaire included the following key components:

2.3 Personal reflection on participants' reading literacy development

Participants were asked to describe their literacy learning trajectories, identifying:

- what they found to be most important and effective in their reading literacy development; and
- what they experienced as most supportive during this process.

2.4 Professional perspectives on opportunities and challenges in the reading literacy development through the use of digital tools

Drawing on their own experiences of using digital technology in teaching, participants were asked to describe:

- the opportunities that digital tools offer for supporting the development of reading literacy; and
- the challenges they associate with the use of digital technologies in early literacy learning environments.

2.5 Data analysis

The data were analysed using qualitative content analysis, following a theory-informed yet inductive approach (Braun & Clarke, 2006; Mayring, 2000; Schreier, 2012). Initial analysis was conducted within the 1KA application. Subsequent stages focused on identifying patterns, meanings, and emergent categories in participants' narratives concerning both their personal literacy development and their perspectives on the role of digital technology in early literacy instruction.

First, the researchers familiarised themselves with the data. All responses were read multiple times to ensure a comprehensive understanding of participants' perspectives. The data were then coded line by line, with attention to meaningful units of text. Coding was both data-driven (grounded in participants' own words) and concept-driven (informed by the research questions and the theoretical framework on digital literacy and early learning).

Emerging codes were synthesised into broader themes that captured participants' shared experiences and interpretations. These themes were interpreted in relation to the aims of the study, relevant literature, and educational policy frameworks concerning early literacy and digital pedagogy.

To ensure trustworthiness, coding was reviewed by two independent researchers, and discrepancies were resolved through discussion. Reflexive notes and audit trails were maintained throughout the process to enhance transparency and analytical rigour.

3 Results

The analysis begins with participants' personal experiences of learning to read, with a particular focus on the factors they perceived as most important and effective in their early literacy development. Through examination of the narratives, the study sought to identify key instructional approaches and interactional elements that shaped participants' literacy trajectories (Table 1).

The results indicate that participants identified a multifaceted set of interrelated factors that contributed to their reading literacy development. These findings underscore the complex and situated nature of literacy acquisition, which emerges at the intersection of individual motivation, social supportive interactions, and educational opportunities. The results align with existing research demonstrating that children's reading skills are closely linked to reading motivation and that early differences in reading ability predict later trajectories of both reading skill and motivation (Morgan & Fuchs, 2007). They also reflect the central role of social interaction (Christ et al., 2014; Vygotsky, 1978) and structured educational opportunities (Neuman & Celano, 2015). Together, these elements create an environment in which learners are emotionally engaged, socially supported, and pedagogically guided toward reading proficiency.

Participants repeatedly emphasised that systematic and frequent engagement with reading activities played a foundational role in improving fluency and comprehension. These reflections align with previous findings on the cumulative effects of daily reading on literacy proficiency, particularly when sustained over time and supported by access to a wide range of texts, including gains in oral reading fluency (Allington, 2014).

Table 1 Factors perceived as most important and effective in literacy development

Thematic category	Code	Example
Regular practice and daily reading	Systematic, frequent, and structured reading	'Practice, practice, practice. It was harder at first, but it got easier later on.' 'At least 15 min every day, and when I was older, even more time during the day.'
Support from adults (parents, teachers)	Support from parents and teachers through assistance, presence, explanation	'A lot of reading, my mom always took the time to practice with me.' 'Good support from my father and teacher.'
Personal motivation and desire to read	Inner desire to learn and progress	'My own desire to learn to read.' 'Above all, desire, my own desire.'
Interesting and appropriate books	Reading attractive, interesting, and age-appropriate books	'Books that I liked.' 'Extensive books that were interesting and also had more complex vocabulary.'
Encouraging home and school environment	An environment that encourages, values, and enables reading	'A very encouraging environment at home.' 'Study habits, an encouraging learning environment at school and at home.'
Repetition and reading aloud	Strategies for reading automation and fluency	'Reading the same fairy tale several times.' 'A lot of reading, practicing reading aloud.'
Reading badges and other school initiatives	Formalised reading promotion by the school	'A Reading badge that forces you to practice reading.' 'Reading lists in elementary school—texts that we read aloud as often as possible.'
Comprehension and reflection	Explanation, comprehension of content, and discussion of the text	'The fact that I understood what I was reading.' 'It also helped that adults explained difficult words and concepts and that we talked about what we had read…'
Access to literature and diverse texts	Choice of books and availability of materials	'Access to the school library.' 'A large selection of books; I could choose which book to read.'
Reading support techniques	Use of support strategies and visual tools	'I had a coloured ruler, and then just my finger.' 'Subtitles in movies.'

Parental and teacher support emerged as a key external factor. The availability of adult guidance, encouragement, and assistance in reading-related tasks was perceived as instrumental. This reinforces socio-cultural theories of learning, which emphasise the scaffolding role of more knowledgeable others in early literacy experiences (Vygotsky, 1978).

In addition to these external influences, participants highlighted self-motivation and intrinsic interest in reading as powerful drivers of literacy development. These internal factors appeared to foster sustained engagement and a sense of agency, in line with motivational and self-determination theory in literacy education (Deci & Ryan, 1985; Guthrie & Wigfield, 2000). The availability of developmentally appropriate and personally engaging books also played a central role. Texts that were both enjoyable and intellectually stimulating were perceived as increasing reading volume and deepening comprehension, supporting research on the importance of text complexity, relevance, and interest in fostering reading motivation (Gambrell, 2011).

An environment that values and supports literacy—whether through routines, encouragement, or access to books—was viewed as essential. These findings highlight the role of both informal home environments and formal school contexts in shaping children's literacy trajectories (Neuman & Celano, 2015; Phillips & Sample, 2005).

Participants also noted that repeated exposure to texts and oral reading activities help them improve reading fluency and decoding skills. These strategies align with instructional

models that emphasise repeated reading as a means of increasing automaticity and accuracy (Samuels, 1979; Schwanenflugel et al., 2006).

Institutional practices, such as reading competitions and structured school-based initiatives (e.g. *Bralna značka*), were reported as effective in motivating sustained reading. These findings support the view that well-designed school interventions can complement familial and personal efforts to enhance literacy development (Ramey & Ramey, 2006). Deeper engagement with text meaning, including vocabulary explanations and discussion of content, was also identified as crucial. This reflects pedagogical approaches that integrate comprehension monitoring and dialogic teaching strategies, which support long-term reading competence. Furthermore, physical access to diverse reading materials, whether in school libraries or at home, was recognised as enabling children to explore texts aligned with their interests and developmental levels, thereby encouraging greater reading engagement.

Participants also mentioned the use of visual aids and multimedia supports (e.g. subtitles, illustrations) that helped them overcome reading challenges, underscoring the importance of assistive and multimodal strategies in literacy development (Unsworth, 2014). When asked what they considered most supportive in their literacy development, participants consistently referred to factors related not only to instruction but also to their social and emotional well-being (Table 2).

The findings suggest that literacy development is most successful in contexts in which learners feel both educationally and emotionally supported, socially connected, and personally empowered. Participants identified the most supportive factors as a stimulating home environment, support from parents and other family members, support from teachers and librarians, and access to books with opportunities for choice. These results reinforce a socio-constructivist perspective (Vygotsky, 1978), emphasising that literacy emerges through socially mediated experiences within supportive contexts rather than in isolation.

A central theme across participants' narratives was the importance of interpersonal support, particularly from parents, family members, teachers, and classmates. These figures were described as pivotal sources of emotional encouragement, feedback, and consistency in reading routines (e.g. 'My mother always took time for me, we read together.'). This aligns with findings by Sénéchal and LeFevre (2002) on the impact of parental involvement in early literacy activities. Teachers and librarians were also perceived as key motivators, consistent with research showing that diverse forms of pedagogical support enhance reading outcomes (Pressley et al., 2001). Peer interaction (e.g. 'classmates', 'friends') further contributed to a collaborative literacy environment, reflecting the role of shared learning experiences, which are often under-recognised in formal education (Vass & Littleton, 2010).

A print-rich and supportive home environment, with accessible reading materials and designated quiet spaces, was frequently cited as a condition for success. Such environments promote emergent literacy skills (Neuman & Celano, 2015) and align with studies demonstrating that children's early language and literacy development is linked to features of the home environment, including parents' educational attainment, shared reading practices, and the availability of reading material (Mol et al., 2008; Rodriquez & Tamis-LeMonda, 2011). The number of books in the home also predicts early reading activities and abilities (Mol & Bus, 2011).

Participants also highlighted the importance of visual supports (e.g. illustrations, symbols) and assistive reading tools (e.g. tracking sheets, enlarged print) for early decoding

Table 2 Factors perceived as most supportive during the process of literacy development

Thematic Category	Code	Example
Support from parents and family members	Active help, being there, motivation, reading together	'My mother always took time for me, we read together.' 'My parents, aunt, mother, grandmother—they all listened to me and corrected me.' 'My parents supported and encouraged me to read.'
Encouraging home environment	An atmosphere that supports reading (quiet, time, books available)	'An encouraging home environment.' 'My parents and the number of books I had at home.'
Support from teachers and librarians	Educational support, explanations, motivation	'My teacher and the librarian, but above all my parents.' 'A pleasant teacher who encouraged us.'
Visual support (illustrations, pictures)	Pictures, images, tactile elements, easier to understand	'The illustrations in the books that attracted me.' 'Pictures that complemented the text.'
Easy and appropriate materials	Adapted books, short, understandable texts	'Easier and simpler books.' 'Books with slightly larger print, not too much text, with pictures.'
Rewards, praise, external motivation	External motivation (rewards, symbolic recognition, praise)	'Praise from teachers, rewards from parents.' 'My grandmother and her bribes of chocolate.' 'Recognition for completing a reading badge.'
Accessibility of materials and reading resources	Access to books, magazines, libraries	'Regular visits to the library.' 'Lots of material to read at home and at school.'
Independent choice and interest	Choice of literature and personal curiosity	'Books I chose myself.' 'That I enjoyed reading.'
Technical aids for reading	Physical aids (rulers, sheets, pictures to help with tracking)	'A sheet I used to cover the lines below.' 'Pictures to replace difficult words and a ruler to follow along.'
Social support (classmates, friends)	Group reading, mutual support	'Friends who also read.' 'Classmates.'
Motivation through limited alternatives	Reading as the only or main leisure activity	'Because I didn't have a phone or a computer, I read more.'
Internal motivation and responsibility	Awareness of importance, self-initiative	'The awareness that I had to learn this.'
Incentives through play/activity	Symbolic recording of progress	'The satisfaction of being able to colour in one flower for each day we read.'

and comprehension. These strategies reflect evidence that multisensory approaches play an important role in reading development for all children (Viji & Dharma Raja, 2017).

Several statements emphasised intrinsic motivation and a sense of personal responsibility as drivers of reading success (e.g. 'The awareness that I need to learn this'). This aligns with self-determination theory (Deci & Ryan, 1985), suggesting that literacy develops more effectively when learners experience autonomy and competence. When children were able to choose reading materials aligned with their interests, they reported greater engagement, consistent with findings by Guthrie and Wigfield (2000) on the role of interest-driven reading.

Interestingly, in some cases, limited access to digital entertainment functioned as a facilitating factor, positioning reading as a primary leisure activity. In the absence of readily available digital devices (e.g. 'Because I didn't have a phone…'), participants experienced fewer competing stimuli and more uninterrupted time, allowing reading to become a mean-

ingful and habitual practice. In this sense, restriction did not operate merely as deprivation but as a condition that redirected attention and everyday routines towards sustained focus and deeper engagement with texts.

Participants reported that gradual exposure to age-appropriate materials—particularly those that were visually appealing and not overly complex—enabled them to build confidence and fluency. Repetitive reading, the use of tracking tools, and play-based strategies (e.g. colouring a flower for each day of reading) were perceived as effective scaffolding mechanisms. Finally, extrinsic motivators—such as praise, symbolic rewards, and formal school-based programmes like *Bralna značka* (*Reading Badge*)—were commonly cited as encouraging factors. While external rewards may not sustain long-term motivation (Deci et al., 1999), they appear to play an important role in initiating reading habits and reinforcing effort in the early phases of literacy development.

The following section introduces participants' perceptions of both the opportunities and challenges associated with integrating digital technologies into early reading literacy development. The tables below present these perceptions in detail. The findings illustrate how digital tools are viewed as enhancing children's engagement, providing diverse resources, and supporting individualised learning while also highlighting concerns about potential drawbacks, such as distractions and reduced interaction with physical texts (Table 3).

Analysis of participants' responses reveals recognition of a wide range of positive potentials associated with technologies in early reading. Participants viewed digital tools as an important complement to, or substitute for, traditional approaches, as they can enhance motivation to read, increase engagement, and accommodate individual learning needs.

Interactive games, apps, and audio content were seen as supporting the development of phonological awareness and enriching vocabulary, while multisensory approaches were perceived as enabling holistic learning that accommodates different learning styles. Research similarly indicates that digital media, including apps and interactive tools, can increase children's motivation and engagement with reading while supporting individualised learning pathways (Beschorner & Hutchison, 2013). Participants also emphasised the value of immediate knowledge testing and instant feedback (Biancarosa & Griffiths, 2012), which can encourage self-regulation and progress. Moreover, digital technology was seen as providing access to a wide range of resources and topics, strengthening motivation and enabling differentiation and individualisation of the learning process.

Importantly, participants noted that digital tools may partially compensate for the absence of adult support in less supportive family environments (Warschauer & Matuchniak, 2010), thereby contributing to greater equity in access to early literacy opportunities.

Overall, the results indicate that participants—future preschool and primary school teachers—recognise digital technology as a valuable didactic resource for supporting early reading development, particularly because of its potential to enable individualised instruction (Table 4).

Analysis of participants' perceptions reveals complex concerns regarding the impact of digital technology on early literacy development. The key challenges identified relate to the cognitive, motivational, and physiological dimensions of reading and writing in digital environments. Notably, even when participants discussed negative effects, the emotional and social dimensions of reading—such as encouragement and interpersonal interaction, which were otherwise recognised as crucial incentives for successful literacy development—were largely absent from these accounts.

Table 3 Opportunities identified in relation to the use of digital technologies in early reading development

Thematic Category	Code	Example
Increased motivation to read	Digital technology brings reading closer to children in an attractive way that appeals to them.	'Perhaps more motivation to read if we read on our phones.' 'Children would find reading more interesting because they are surrounded by technology.'
Interactive content and games	Apps, games, and interactive tasks increase engagement and facilitate learning.	'Various games where children learn to read.' 'Interactive games for practicing reading.'
Adaptation to individual needs	Content can be tailored to children's knowledge level, pace, and difficulties	'Content tailored to the individual, which encourages independent learning.' 'Programmes where you can colour the letters b and d differently, for example.'
Audio support and listening	Audiobooks, storytelling, and listening to stories help with comprehension and vocabulary enrichment.	'I find audio recordings very useful.' 'Listening to fairy tales via digital technology.'
Support for voice and letter recognition	Digital tools help with phonological awareness, sound analysis, and synthesis.	'They help distinguish between letters and improve voice recognition in a fun way.' 'Exercises for pronouncing sounds.'
Multisensory approaches	The combination of auditory, visual, and tactile stimuli supports different learning styles.	'Something that also stimulates other channels: hearing and touch in addition to sight.'
Access to diverse resources and topics	Technology provides access to different types of texts, genres, and interests.	'With the help of digital technology, we can access various resources very quickly.' 'Various text and word games.'
Immediate feedback	Apps enable immediate feedback, which encourages progress.	'Feedback on mistakes helps with learning.'
Learning at your own pace	Children can learn independently, whenever they want, also at home.	'Independent learning at an adapted pace.' 'The child could learn to read independently.'
Support in case of lack of family support	Technology can replace or supplement the role of adults in less supportive environments.	'If the child does not have the right conditions for learning to read, I would recommend listening to fairy tales.'

Participants express the belief that reading physical books fosters a stronger sensory and emotional connection with the text. Physical contact with a book, turning pages, and even its smell were described as integral to the reading experience—elements that digital media cannot replicate. This difference was perceived as particularly important in early developmental stages, aligning with the finding that physical books provide a unique sensory and emotional experience that e-books cannot fully reproduce (Mangen et al., 2013). In contrast, digital technology was often viewed as a source of constant stimulation that undermines sustained attention. Participants emphasised that excessive exposure may lead to dependence on rapidly changing content, thereby reducing the capacity for in-depth reading.

Several responses pointed to a shift in reading habits towards faster and more superficial practices dominated by short, visually stimulating texts. Such patterns were perceived as insufficient for developing comprehension, analytical thinking, and vocabulary–an observation supported by previous research. Digital environments offer continuous stimuli that fragment attention and undermine deep reading. Screen-based reading tends to encourage 'skimming' at the expense of deep comprehension (Wolf, 2018), and studies have also reported increased distraction and reduced understanding when reading digitally (Baron, 2021).

Table 4 Challenges identified in relation to the use of digital technologies in early reading development

Thematic Category	Code	Example
Lack of contact with physical books	Importance of the tangibility of books, leafing through pages, and personal contact as essential for the development of reading literacy.	'Because then we have no contact with real books and don't know "what a book is".' 'Too little work with physical books, children would not get enough interaction with page turning.'
Addiction and loss of concentration	Due to rapid visual stimuli, digital technology can lead to addiction, concentration disorders, and superficial processing of information.	'Excessive use of digital technologies can lead to a shift in attention, as children quickly lose focus due to interactive content, games, or screens.' 'Technology has a negative impact on concentration… because they have lots of stimuli turned on.'
Superficial and fast reading	Technology encourages shorter, less demanding content, which can reduce patience for long, in-depth reading.	'Above all, digital technologies encourage fast and, above all, superficial reading.' 'Children get used to short, visually appealing information and lose patience with longer, more demanding texts.'
Inappropriate or irrelevant content	Users express concern about inappropriate, non-educational, slang, or commercial content that does not contribute to learning.	'Teachers don't judge which content is appropriate and will contribute to knowledge and which won't.' 'Too much slang; overly simple language.'
Incorrect or misleading information	Digital tools can provide access to false information, which threatens the development of understanding and critical thinking.	'Not everything on the internet is true and accurate, so false information could hinder development.' 'Incorrect information.'
Decreased motivation to read classic texts	Loss of interest in traditional forms of reading because digital formats offer more attractive alternatives.	'Lack of motivation to read classic texts and books.' 'Children would only want to learn with the help of digital technology.'
Overstimulation	Sensory overload, which can inhibit learning.	'Overloaded from all sides (visual, auditory channels, etc.), which could have a negative impact on the reading learning process.'
Digital and physical experiences are not the same	Reading digital texts is not equivalent to physical reading due to differences in typography, perception, and comprehension.	'Reading on digital devices is not the same as reading a physical book.' 'The letters are slightly different on a computer, which could confuse children.'
Negative impact on health (vision, eyes, physical health)	Concerns about the impact of prolonged screen use on children's health.	'Too much time in front of screens.' 'Poor eyesight; harmful to the eyes.'
Insufficient teacher assessment of appropriateness and guidance	Insufficient assessment of the appropriateness of digital content use by teachers can lead to ineffective use.	'The teacher does not judge which content is appropriate and will contribute to knowledge and which is not.'

Participants also expressed concern that digital environments frequently include slang, trivial material, or commercial content that does not support early literacy goals. Weak regulation and limited adult mediation may expose children to material that is inappropriate for their age and developmental stage. While digital environments provide broad access to information, they also increase exposure to false, misleading, or low-quality content. Participants warned that unsupervised use of online resources could lead to distorted understandings of the world, underscoring the need for critical adult guidance.

Digital technology was further perceived as an attractive alternative that may reduce children's motivation to engage in traditional forms of reading. This raises the risk that children will come to prefer digital content, potentially neglecting book reading, which participants viewed as essential for developing deeper literacy skills. Several participants reported sensory overload in children exposed to multiple visual, auditory, and interactive stimuli. Such overload was seen as an obstacle to sustained concentration and cognitive processing.

Digital reading was not perceived as equivalent to traditional reading. Differences in typography, tactility, spatial orientation, and perceptual experience were believed to affect reading comprehension and comfort, particularly for children in the early stages of literacy development. Participants also highlighted health concerns associated with prolonged screen use, including eye strain, headaches, and reduced physical activity. These issues were linked to potential long-term consequences for children's physical well-being and, indirectly, for learning and cognitive performance (Jain et al., 2023).

Finally, participants questioned the adequacy of some teachers' digital competencies. They expressed concern that insufficient pedagogical and evaluative skills may limit teachers' ability to assess content quality or to design effective, developmentally appropriate uses of technology in literacy instruction.

3.1 Discussion and conclusion

The aim of the study was to explore the perceptions of prospective preschool and primary school teachers regarding the role of digital technology in the development of reading literacy. Specifically, it examined how participants reflected on their own experiences of literacy acquisition and how they evaluated both the opportunities and challenges associated with integrating digital tools into early literacy instruction, drawing on their engagement in higher education projects designed to foster digital teaching competencies.

The findings underscore the importance of a supportive ecosystem—encompassing individual, interpersonal, and institutional factors—in nurturing successful literacy development. These insights have implications for teacher education and literacy instruction, highlighting the need to combine evidence-based practices with personalised approaches that address diverse learner needs.

The study illustrates the complexity and interplay of factors shaping reading literacy development at the intersection of individual motivation, social support, and educational opportunity. Consistent with prior research, participants emphasised that regular reading practice is fundamental to improving fluency and comprehension (Allington, 2014; Mol & Bus, 2011).

Participants repeatedly highlighted the crucial role of parental and teacher support, reinforcing socio-cultural theories that emphasise adult scaffolding in early literacy development (Sénéchal & LeFevre, 2002; Vygotsky, 1978). Beyond instructional support, participants stressed the emotional dimension of adult involvement. At the same time, intrinsic motivation and personal interest in reading were identified as central, aligning with motivational and self-determination theory (Deci & Ryan, 1985; Guthrie & Wigfield, 2000).

Engaging and developmentally appropriate texts further enhanced reading enjoyment and comprehension, confirming the importance of text relevance and complexity in sustaining interest. Both home and school environments that provided a routine, encouragement, and access to reading materials were seen as critical supports. Repeated reading and oral

practice aided fluency and decoding, while institutional initiatives such as *Bralna značka* (Reading Badge)—a permanent national programme operating since 1961 in all Slovenian primary schools—were reported to boost motivation. Since March 21, 2019, the Reading Badge Movement has been included in the national register of intangible cultural heritage.

Participants emphasised that social and emotional support is essential throughout the reading process, indicating that affective dimensions are integral to literacy development. Overall, the results show that future preschool and primary school teachers adopt a critical yet open stance towards digital technologies. They identify key advantages, including increased motivation, individualisation, interactivity, multisensory learning, and access to diverse content. Digital tools are seen as enabling self-paced learning, immediate feedback, and partial compensation for limited family support. When used thoughtfully, digital technology is therefore recognised as a valuable complementary resource that can strengthen literacy and expand learning opportunities for all children.

At the same time, participants' reflections reveal a cautious and evaluative attitude towards the use of digital technology in early literacy processes. Digital technologies are not rejected; rather, their use is viewed as requiring careful planning, balance, and supervision. Key challenges include cognitive overload, reduced attention, diminished reading depth, health concerns, and questionable content quality. Children are regarded as vulnerable users who require informed guidance from adults, particularly parents and educators.

Participants also attributed many of the identified risks to teachers' potential lack of knowledge about how to employ technology appropriately for literacy instruction. The study involved undergraduate students with extensive experience in everyday digital use, in creating digital teaching materials, and in working with children during their studies. Their perspectives therefore reflect informed, experience-based judgments. Given that teachers' subjective theories strongly influence classroom interaction, expectations, and behaviour, these views are highly relevant: together with professional knowledge and pedagogical skills, they will shape future instructional choices and practices.

National data further contextualise these findings. The Slovenian study *Knjiga in bralci VI* (Books and Readers VI) (Rupar et al., 2019) emphasises the importance of fostering a positive attitude towards reading from an early age, particularly among at-risk groups (e.g. young people and individuals with special needs). Reading habits in Slovenia are shaped by gender, educational level, and attitudes towards reading, underscoring the need for culturally responsive approaches to literacy promotion (Vilar, 2017). The present findings indicate that future teachers recognise the importance of serving as positive reading role models, which will likely shape their future teaching practice. Thus, teachers play an essential role in providing incentives and developing motivation for reading. However, *Knjiga in bralci VII* (Gerčar et al., 2024) found that only around one-fifth of parents read aloud to their children daily, despite strong international evidence demonstrating the influence of the home learning environment on vocabulary and literacy development (Golinkoff et al., 2019; Rodríguez & Tamis-LeMonda, 2011).

Drawing on participants' personal reflections and professional experiences, the findings underscore that, despite the growing availability of digital resources, the emotional and social dimensions of literacy remain indispensable. Family context, teacher encouragement, and peer interaction continue to play a central role in shaping children's reading engagement and literacy development. While digital technologies can effectively support self-regulated learning, individualised pacing, and access to diverse materials, they cannot replace the

relational and affective foundations of early literacy. Participants' reflections suggest a clear awareness that technology is most beneficial when embedded within a supportive pedagogical framework that prioritises human interaction, guidance, and emotional security.

From an educational and political perspective, these findings point to the need for curriculum redesign in teacher education. The education of future preschool and primary school teachers thus must ensure that they learn about, explore, and evaluate ways of integrating technology into the teaching process during their initial teacher education and later in their professional development.

Teachers must be equipped not only to use digital tools but also to do so in ways that are pedagogically grounded, developmentally appropriate, and sensitive to learners' social and emotional needs. Participants' insights suggest that learning outcomes alone are insufficient; equal attention must be paid to the quality of the learning process and to children's well-being. Ensuring high levels of reading literacy therefore requires a holistic approach that integrates social, emotional, and instructional dimensions. Creating supportive, socially connected, and personally empowering learning environments thus emerges as a key condition for fostering lifelong readers in both digital and non-digital contexts.

Conflict of interest The authors have no competing interests to declare and no financial, professional, or personal relationships that could have influenced the research or outcomes presented in this study.

References

Allington, R. L. (2014). How reading volume affects both reading fluency and reading achievement. *International Electronic Journal of Elementary Education*, *7*(1), 13–26.

Baloh, B. (2015). Aplikativni Vidik Otrokovega Pripovedovanja v predšolskem Obdobju. *Journal of Elementary Education*, *8*(4), 5–28.

Baron, N. S. (2021). *How we read now: Strategic choices for print, screen, and audio*. Oxford University Press.

Beschorner, B., & Hutchison, A. (2013). iPads as a literacy teaching tool in early childhood. *International Journal of Education in Mathematics Science and Technology*, *1*(1), 16–24.

Biancarosa, G., & Griffiths, G. G. (2012). Technology tools to support reading in the digital age. *Future of Children*, *22*(2), 139–160.

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, *3*(2), 77–101. https://doi.org/10.1191/1478088706qp063oa

Christ, T., Wang, X. C., & Chiu, M. M. (2014). Emergent readers' social interaction styles and their comprehension processes during buddy reading. *Literacy Research and Instruction*, *54*(1), 45–66. https://doi.org/10.1080/19388071.2014.968301

Deci, E. L., & Ryan, R. M. (1985). Intrinsic motivation and self-determination in human behavior. *Springer*. https://doi.org/10.1007/978-1-4899-2271-7

Deci, E. L., Koestner, R., & Ryan, R. M. (1999). A meta-analytic review of experiments examining the effects of extrinsic rewards on intrinsic motivation. *Psychological Bulletin*, *125*(6), 627–668. https://doi.org/10.1037/0033-2909.125.6.627

du Preez, J. (2008). Locating the researcher in the research: Personal narrative and reflective practice. *Reflective Practice*, *9*(4), 509–519. https://doi.org/10.1080/14623940802431499

Ertmer, P. A., & Ottenbreit-Leftwich, A. T. (2010). Teacher technology change: How knowledge, confidence, beliefs, and culture intersect. *Journal of Research on Technology in Education*, *42*(3), 255–284. https://doi.org/10.1080/15391523.2010.10782551

European Commission (2025). *Digital education action plan 2021–2027: Resetting education and training for the digital age*. https://education.ec.europa.eu/focus-topics/digital-education/plan

Fälth, L., & Selenius, H. (2024). Primary school teachers' use and perception of digital technology in early reading and writing education in inclusive settings. *Disability and Rehabilitation: Assistive Technology*, *19*(3), 790–799. https://doi.org/10.1080/17483107.2022.2125089

Flanagin, A. J., & Metzger, M. J. (2007). The role of site features, user attributes, and information verification behaviors on the perceived credibility of web-based information. *New Media & Society*, *9*(2), 319–342. https://doi.org/10.1177/1461444807075015

Gambrell, L. B. (2011). Seven rules of engagement: What's most important to know about motivation to read. *The Reading Teacher*, *65*(3), 172–178. https://doi.org/10.1002/TRTR.01024

Gerčar, J., Kovač, M., & Blatnik, A. (2024). In S. Rugelj (Ed.), *Knjiga in Bralci VII: Bralna kultura in Nakupovanje Knjig v Sloveniji v Letu 2024*. UMco.

Golinkoff, R. M., Hoff, E., Rowe, M. L., Tamis-LeMonda, C. S., & Hirsh-Pasek, K. (2019). Language matters: Denying the existence of the 30-million-word gap has serious consequences. *Child Development*, *90*(3), 985–992.

Guthrie, J. T., & Wigfield, A. (2000). Engagement and motivation in reading. In M. L. Kamil, P. B. Mosenthal, P. D. Pearson, & R. Barr (Eds.), *Handbook of reading research* (Vol. 3, pp. 403–422). Lawrence Erlbaum Associates.

Halliday, M. A. K. (1977). Text as semantic choice in social contexts. In J. J. Webster (Ed.), *Linguistic studies of text and discourse* (pp. 23–84). Continuum.

Haramija, D. (Ed.). (2020). *Gradniki bralne pismenosti: Teoretična izhodišča*. Univerzitetna založba Univerze v Mariboru. https://press.um.si/index.php/ump/catalog/book/515

Jain, S., Shrivastava, S., Mathur, A., Pathak, D., & Pathak, A. (2023). Prevalence and determinants of excessive screen viewing time in children aged 3–15 years and its effects on physical activity, sleep, eye symptoms and headache. *International Journal of Environmental Research and Public Health*, *20*(4), 3449.

Kjeldsen, C. C., & Perović, I. E. (2025). Impact of home environmental support on reading achievement. In P. Koršňáková, S. M. Dinaric, & Ž. Džumhur (Eds.) *Dinaric perspectives on PIRLS 2021: Prerequisites and conditions for teaching and learning to read* (pp. 133–150). Springer. https://doi.org/10.1007/978-3-031-88002-5

Korthagen, F. (2017). Inconvenient truths about teacher learning: Towards professional development 3.0. *Teachers and Teaching*, *23*(4), 387–405.

Kreuh, N. (2014). Zapis prvega strokovnega tematskega razgovora o bralni pismenosti. In A. Barle Lakota & M. (Eds.), *Za dvig bralne pismenosti. Zbornik prispevkov strokovnega tematskega razgovora na Ministrstvu za izobraževanje, znanost in šport.* Ministrstvo za izobraževanje, znanost in šport Zavod RS za šolstvo. http://www.zrss.si/pdf/Za-dvig-digitalne-pismenosti.pdf

Mangen, A., Walgermo, B. R., & Brønnick, K. (2013). Reading linear texts on paper versus computer screen: Effects on reading comprehension. *International Journal of Educational Research*, *58*, 61–68. https://doi.org/10.1016/j.ijer.2012.12.002

Marjanovič Umek, L., Fekonja, U., & Hacin, K. (2019a). Dodatni program Za Spodbujanje Zgodnje pismenosti v vrtcu: kratkoročni in dolgoročni učinki. *Sodobna Pedagogika*, *70*(3), 112–125.

Marjanovič Umek, L., Hacin, K., & Fekonja, U. (2019b). The quality of mother–child shared reading: Its relations to child's storytelling and home literacy environment. *Early Child Development and Care*, *189*(7), 1135–1146.

Mayring, P. (2000). Qualitative content analysis. *Forum Qualitative Sozialforschung Forum: Qualitative Social Research*, *1*(2). https://doi.org/10.17169/fqs-1.2.1089

McKool, S. S., & Gespass, S. (2009). Does johnny's reading teacher love to read? How teachers' personal reading habits affect instructional practices. *Literacy Research and Instruction*, *48*(3), 264–276. https://doi.org/10.1080/19388070802443700

Mol, S., & Bus, A. (2011). To read or not to read: A meta-analysis of print exposure from infancy to early adulthood. *Psychological Bulletin*, *137*(2), 267–296. https://doi.org/10.1037/a0021890

Mol, S., Bus, A., deJong, M., & Smeets, D. (2008). Added value of dialogic parent-child book readings: A meta-analysis. *Early Education and Development*, *19*(1), 7–26. https://doi.org/10.1080/10409280701838603

Morgan, P. L., & Fuchs, D. (2007). Is there a bidirectional relationship between children's reading skills and reading motivation? *Exceptional Children*, *73*(2), 165–183. https://doi.org/10.1177/001440290707300203

Neuman, S. B., & Celano, D. C. (2015). *Giving our children a fighting chance: Poverty, literacy, and the development of information capital*. Teachers College.
New London Group. (1996). A pedagogy of multiliteracies: Designing social futures. *Harvard Educational Review*, *66*(1), 60–92. https://doi.org/10.17763/haer.66.1.17370n67v22j160u
Organisation for Economic Co-operation and Development (OECD). (2021). 21st-century readers: Developing literacy skills in a digital world. *OECD Publishing*. https://doi.org/10.1787/a83d84cb-en
Pečjak, S. (2021). Reading culture from the psychological and educational perspectives. *Journal of Elementary Education*, *14*(4), 461–483. https://doi.org/10.18690/rei.14.4.461-483.2021
Pečjak, S., Pirc, T., & Čepič, A. V. (2024). Reading motivation profiles in children and adolescents. *Pedagoška Obzorja*, *39*(2), 84–102.
Phillips, L. M., & Sample, H. L. (2005). Family literacy: Listen to what the families have to say. In J. Anderson, M. Kendrick, T. Rogers, & S. Smythe (Eds.), *Portraits of literacy across families, communities, and schools: Intersections and tensions* (pp. 91–113). Lawrence Erlbaum Associates.
Požar Matijašič, N. (Ed.). (2023). *Nacionalna strategija za razvoj bralne pismenosti za obdobje 2019–2030.* https://www.zrss.si/pdf/strategija_bralna_pismenost.pdf
Pressley, M., Wharton-McDonald, R., Allington, R., Block, C. C., Morrow, L., Tracey, D., Baker, K., Brooks, G., Cronin, J., Nelson, E., & Woo, D. (2001). A study of effective first-grade literacy instruction. *Scientific Studies of Reading*, *5*(1), 35–58. https://doi.org/10.1207/S1532799XSSR0501_2
Ramey, S. L., & Ramey, C. (2006). Early educational interventions: Principles of effective and sustained benefits from targeted early education programs. In D. Dickinson, & S. B. Neuman (Eds.), *Handbook of early literacy research* (Vol. II, pp. 445–459). Guilford.
Rodriquez, E., & Tamis-LeMonda, C. (2011). Trajectories of the home learning environment across the first 5 years: Associations with children's vocabulary and literacy skills at prekindergarten. *Child Development*, *82*(4), 1058–1075. https://doi.org/10.1111/j.1467-8624.2011.01614.x
Rot Vrhovec, A., & Godec Soršak, L. (2024). Students' vocabulary and reading comprehension. *European Journal of Educational Research*, *13*(4), 1665–1678. https://doi.org/10.12973/eu-jer.13.4.1665
Rupar, P., Blatnik, A., Kovač, M., & Rugelj, S. (2019). *Knjiga in Bralci VI: Bralna kultura in Nakupovanje Knjig v Sloveniji v Letu 2019*. UMco.
Samuels, S. J. (1979). The method of repeated readings. *The Reading Teacher*, *32*(4), 403–408.
Schreier, M. (2012). *Qualitative content analysis in practice*. Sage.
Schwanenflugel, P. J., Meisinger, E. B., Wisenbaker, J. M., Kuhn, M. R., Strauss, G. P., & Morris, R. D. (2006). Becoming a fluent and automatic reader in the early elementary school years. *Reading Research Quarterly*, *41*(4), 496–522.
Selwyn, N. (2016). *Education and technology: Key issues and debates* (2nd ed.). Routledge.
Sénéchal, M., & LeFevre, J. A. (2002). Parental involvement in the development of children's reading skill: A five-year longitudinal study. *Child Development*, *73*(2), 445–460.
Spitzer, M. (2016). *Digitalna demenca: Kako Spravljamo Sebe in Svoje Otroke Ob Pamet*. Mohorjeva družba.
Spitzer, M. (2021). *Epidemija Pametnih telefonov: Nevarnosti Za zdravje, izobraževanje in družbo*. Mohorjeva družba.
Starc, S. (2011). Zmožnost Dekodiranja večkodnih besedil Kot Sestavina besedilne pismenosti. In M. Cotič, V. Medved-Udovič, & S. Starc (Eds.), *Razvijanje različnih pismenosti* (pp. 28–36). Univerza na Primorskem, Znanstveno-raziskovalno središče, Univerzitetna založba Annales.
Starc, S. (2024). Pouk slovenščine in besedilna/večkodna pismenost: Razmislek Ob Prenavljanju učnih načrtov Za slovenščino. *Jezik in Slovstvo*, *69*(3), 79–93.
Šterman Ivančič, K., & Mlekuž, A. (2023). *PISA 2022: Program Mednarodne primerjave dosežkov učencev in učenk: Nacionalno poročilo s primeri Nalog Iz matematike*. Pedagoški inštitut. https://www.pei.si/wp-content/uploads/2024/04/Porocilo22_final_26032024.pdf
Tancig, S. (2016). Od Prousta do Twitterja—nevroedukacijske raziskave bralne pismenosti digitalni dobi. In T. Devjak & I. Saksida (Eds.) *Bralna pismenost kot izziv in odgovornost (*pp 9–26). UL Pedagoška fakulteta. https://www.pef.uni-lj.si/wp-content/uploads/2022/07/Bralna-pismenost_Posvet-PeF-2016.pdf
Tondeur, J., Van Braak, J., Ertmer, P. A., & Ottenbreit-Leftwich, A. (2017). Understanding the relationship between teachers' pedagogical beliefs and technology use in education: A systematic review of qualitative evidence. *Educational Technology Research and Development*, *65*(3), 555–575.
United Nations Educational, Scientific and Cultural Organization (UNESCO). (2022). *Reimagining our futures together: A new social contract for education*. UNESCO Publishing. https://unesdoc.unesco.org/ark:/48223/pf0000379707
Unsworth, L. (2014). Multimodal reading comprehension: Curriculum expectations and large-scale literacy testing practices. *Pedagogies: an International Journal*, *9*(1), 26–44. https://doi.org/10.1080/1554480X.2014.878968

Vass, E., & Littleton, K. (2010). Peer collaboration and learning in the classroom. In K. Littleton, C. Wood, & J. Kleine Staarman (Eds.), International handbook of psychology in education (pp. 105–136). Emerald.
Viji, B., & Dharma Raja, W. (2017). Preparing teachers for multisensory teaching strategy to improve the learning outcomes of students with reading disabilities. *TJELLS | the Journal for English Language and Literary Studies*, *7*(4), 7. https://brbs.tjells.com/index.php/tjells/article/view/220
Vilar, P. (2017). Branje, zaklad življenja: Knjižnica in predšolski otrok. In D. Haramija (Ed.), *V objemu besed: razvijanje družinske pismenosti* (pp. 173 – 184). Univerzitetna založba Univerze v Mariboru. https://press.um.si/index.php/ump/catalog/book/268
Vygotsky Semyonovich, L. (1978). *Mind and society*. Harvard University Press.
Wake, D., & Whittingham, J. (2013). Teacher candidates' perceptions of technology supported literacy practices. *Contemporary Issues in Technology and Teacher Education*, *13*(3), 175–206.
Warschauer, M., & Matuchniak, T. (2010). New technology and digital worlds: Analyzing evidence of equity in access, use, and outcomes. *Review of Research in Education*, *34*(1), 179–225.
Wijayanti, E., Mujiyanto, Y., & Pratama, H. (2022). The influence of the teachers' reading habit on their teaching practice: A narrative inquiry. *English Education Journal*, *12*(2), 205–214.
Wolf, M. (2018). *Reader, come home: The reading brain in a digital world*. HarperCollins.