



Short Communication

Promoting digital literacy for all: A school-based webinar initiative

Teresa Pinheiro ^{a,*}, Ana Filipa Mouro ^b, Ilídia Cabral ^c^a School of Medicine and Biomedical Sciences, Porto University, Pediatrics and Neonatology Department, Unidade Local de Saúde Entre Douro e Vouga, Portugal^b Pediatrics and Neonatology Department, Unidade Local de Saúde Entre Douro e Vouga, Portugal^c Research Centre for Human Development, Faculty of Education and Psychology, Portuguese Catholic University, Colégios Ribadouro, Private School Establishments, Portugal

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ABSTRACT

This study describes a school-based digital literacy intervention designed to strengthen collaboration between families and educators during a structured digital transition. The initiative consisted of a five-part webinar series on digital literacy. The sessions, accessible both live and asynchronously, combined evidence-based guidance with practical strategies. An anonymous survey of the school community revealed high ratings for overall relevance and applicability to family contexts. Participation barriers mirrored patterns described in the literature on parental engagement. The results highlight the potential of concise, targeted, and accessible interventions to promote school-family partnerships in navigating children's digital lives.

As societies experience an accelerated digital transformation, the ability to use technology critically and responsibly has become essential for lifelong learning, civic participation and personal well-being. Digital technologies have expanded access to information, communication and creativity (OECD, 2021), but their rapid diffusion, without clear rules and guidance, has also introduced complex challenges for families and schools. Children today grow up immersed in connected environments that influence their social interactions, attention and emotional regulation (American Academy of Pediatrics, 2016; OECD, 2021). Parents and educators must therefore navigate new responsibilities in guiding digital behaviour, a task that often involves uncertainty and evolving social norms (Nikken & de Haan, 2015). Although awareness of online safety and screen-time balance has increased (American Academy of Pediatrics, 2016; Nikken & de Haan, 2015), research consistently shows that many adults still feel ill-prepared to help children make informed and balanced digital choices (Chaudron et al., 2018; Livingstone et al., 2023; OECD, 2021).

Schools occupy a privileged position to respond to this challenge. Beyond their instructional function, they are community institutions capable of promoting collective digital literacy and fostering partnerships between teachers and families. This dual role (educational and social) makes them ideal settings for initiatives that encourage reflection, shared responsibility and critical digital engagement. Policy frameworks such as the European Commission's Digital Education Action Plan (European Commission, 2019, 2022) and the Council of

Europe's Digital Citizenship Education Handbook (Council of Europe, 2022) highlight that digital competence must encompass not only technical skill but also political awareness, empathy and well-being. Nevertheless, large-scale assessments continue to reveal disparities in digital readiness among learners and educators, suggesting the need for inclusive interventions that address both skill and mindset (OECD, 2023).

In this context, the present initiative was developed in a group of private schools in Portugal that began a digital transition in the 2023/2024 academic year. The program sought to connect evidence-based knowledge with the lived experiences of families and educators, acknowledging that effective digital literacy depends on collaboration across home and school contexts. The specific aim of the study was to evaluate the perceived relevance and usefulness of a school-based webinar series on digital literacy, focusing on its potential to foster communication and cooperation between educational stakeholders.

Digital literacy is widely recognized as a core competence for life, learning, and citizenship in the 21st century. While early definitions focused primarily on technical skills, more recent frameworks incorporate critical thinking, safety, communication, and digital well-being into the designation (European Commission, 2019). In educational contexts, digital literacy encompasses not only the use of digital tools but also the understanding, evaluation, and participation in the digital world in informed and responsible ways (European Commission, 2022). For children and adolescents, these competencies develop through guided

* Corresponding author.

E-mail address: atavpinheiro@gmail.com (T. Pinheiro).

participation and role modelling from adults. However, adult mediation practices are highly heterogeneous. Parents often oscillate between restrictive supervision and permissive trust, shaped by their own confidence, digital habits, and anxiety (Livingstone et al., 2023; Nikken & de Haan, 2015). Educators face similar tensions as they balance curriculum demands, safety concerns and the pedagogical potential of technology. However, they play distinct roles: parents provide emotional and regulatory guidance, while educators foster critical analysis and digital creativity, emphasizing collaboration rather than separation of these responsibilities (Livingstone et al., 2023; McGarr & McDonagh, 2019; Windasari & Dheasari, 2024).

Recognized frameworks such as the Common Sense Digital Citizenship Curriculum (Livingstone et al., 2023) offer structured approaches to promoting these competencies. Organized into six thematic domains (media balance and well-being, privacy and security, digital footprint and identity, relationships and communication, cyberbullying and hate speech, and news and media literacy), this curriculum aligns with the holistic perspective advocated by European educational policy. Complementarily, the Council of Europe's handbook (Council of Europe, 2022) emphasizes that schools and families must work together to nurture empathy, privacy awareness, and responsible participation from early childhood. Guided by these principles, the current project combined pedagogical structure with clinical expertise from pediatricians, who acted as facilitators to bridge developmental science and practical family realities.

The intervention consisted of five webinars delivered between February and June 2025, each lasting approximately 30 min. The sessions addressed five major topics: early digital exposure, social media use, the first mobile phone, online games, and parental digital anxiety. Each webinar was explicitly mapped to relevant domains of the Common Sense Digital Citizenship framework. All sessions were streamed live via Zoom® (Zoom Video Communications Inc.) and subsequently made available for asynchronous viewing on the school's internal digital platform, ensuring ongoing accessibility for families and staff. Participation was free and open to all members of the school community, including parents, teachers, early childhood educators, and psychologists. Promotional efforts included personalized email invitations and posts on the institution's official Instagram® page to raise awareness.

At the conclusion of the webinar series, a brief anonymous satisfaction survey was distributed to the entire school community (n = 2791) via institutional email, using Google Forms™ (Google LLC). Before participation, all individuals received an information notice explaining the purpose of the initiative, the voluntary nature of involvement, and data confidentiality. Responses were collected anonymously, and no identifying information, such as names, email addresses, or IP data, was recorded or stored, ensuring full anonymity and data protection. Informed consent was obtained electronically before the feedback questionnaire was submitted. As the project collected no personal or sensitive data and complied with national and institutional ethical standards, formal ethics approval was not required. The questionnaire included 12 items, combining multiple-choice and 5-point Likert-scale questions on participation mode, perceived relevance, applicability of strategies, influence on family practices, and satisfaction with communication and logistics. An open-ended section invited additional comments and suggestions for future topics. A total of 244 valid responses were obtained (response rate 8.7%). No reminder messages were sent to potential respondents, which may have contributed to the modest response rate. While this relatively modest rate suggests some caution regarding generalizability, it nonetheless provides valuable insights into parental perspectives and highlights patterns that can inform future initiatives.

Among respondents, 28 individuals (11.5%) reported attending at least one webinar, while 88.5% did not participate. Participation data (Table 1) showed that nearly two-thirds of participants attended three or more webinars, suggesting sustained interest among those who engaged. **While it is not possible to estimate the total number of views of the**

Table 1
Characterisation of webinar participants (questionnaire results).

| Participation | n | % | Mean no. of webinars attended (SD) |
|---|----|-------------------------|------------------------------------|
| Live only | 6 | 21.4 | 1.8 (0.4) |
| Recorded only | 13 | 46.4 | 2.5 (1.4) |
| Mixed (live + recorded) | 9 | 32.1 | 3.1 (1.2) |
| Webinar participants by number of sessions attended | | | |
| Nr of webinars watched | n | % (within participants) | |
| 1 | 5 | 17.9 | |
| 2 | 6 | 21.4 | |
| 3 | 7 | 25.0 | |
| 4 | 3 | 10.7 | |
| 5 | 7 | 25.0 | |

recorded sessions, registration and access data from the school's internal platform indicate that the actual number of individuals who viewed the webinars live was higher than the proportion of survey respondents who reported participation, suggesting that engagement extended beyond those captured in the questionnaire (mean of views during the webinar series 50.2/minimum 42, maximum 82).

Attendance was analysed by both the number of webinars attended and the modality of participation. Based on self-reported information, three categories were created: *live only*, *recorded only*, and *mixed* (live and recorded). Among the 28 participants who reported attending at least one session (Table 1), 46.4% followed exclusively in recorded format, 21.4% only in live format, and 32.1% in a mixed modality. The distribution of the number of webinars watched showed that almost half of the participants (60.7%) attended three or more sessions, whereas smaller proportions reported watching one (17.9%) or two (21.4%) sessions. These descriptive data provide a more nuanced characterisation of participants and allow for exploratory comparisons across subgroups.

The main reason cited for non-participation was a lack of availability (81.9%), followed by a perceived absence of need for additional information (9.3%). Among the attendees, the primary motivations for participating included the need to support children's digital experiences (64.3%), personal interest (60.7%) and general curiosity (10.7%).

Descriptive analyses of participants' evaluations revealed overall high ratings across all dimensions, irrespective of the number of webinars attended or the format of participation.

- Overall relevance: mean = 4.57, SD = 0.63
- Applicability of strategies to family context: mean = 4.18, SD = 0.72
- Influence on perception of adults' role in digital guidance: mean = 4.04, SD = 0.69
- Perceived influence on family practices: mean = 3.71, SD = 0.81

Participants who attended three or more sessions tended to report higher perceived relevance (M = 4.65) and applicability (M = 4.24) than those who attended only two webinars. Likewise, participants who engaged exclusively via recordings provided slightly higher ratings of influence on family practices (M = 3.85) than those in the mixed group (M = 3.44). Although these variations are not statistically tested due to the small sample size, they offer preliminary insights into engagement patterns that may inform the design of future initiatives (Table 2).

The open-ended responses provided additional insight into participants' perspectives. Motivations for attending the webinars (n = 28) primarily centered on the desire to acquire practical strategies for family digital practices and general curiosity about the topics. Although only three respondents described concrete changes in family routines, their accounts pointed to increased awareness of screen time management and the establishment of more precise digital boundaries, suggesting that even a limited number of participants perceived the direct applicability of the content. Suggestions for improvement (n = 28) highlighted the importance of logistical and structural factors, such as

Table 2

Global evaluation metrics by number of webinars attended and by participation format. Note. Values are expressed as mean ± standard deviation. Results are descriptive only due to the small sample size (n = 28). Confidence intervals (95%) were also calculated to indicate the precision of mean estimates (not shown due to small sample size).

| Group | n | Overall relevance (1-5) | Applicability to family context (1-5) | Influence on adults' role (1-5) | Influence on family practices (1-5) |
|------------------------------------|----|-------------------------|---------------------------------------|---------------------------------|-------------------------------------|
| Number of webinars attended | | | | | |
| 1 | 5 | 4.80 ± 0.45 | 4.60 ± 0.55 | 4.00 ± 0.71 | 3.80 ± 0.84 |
| 2 | 6 | 4.17 ± 0.75 | 3.67 ± 0.52 | 4.00 ± 0.63 | 3.50 ± 0.84 |
| ≥3 | 17 | 4.65 ± 0.61 | 4.24 ± 0.75 | 4.06 ± 0.75 | 3.76 ± 0.83 |
| Format of participation | | | | | |
| Live only | 6 | 4.50 ± 0.84 | 4.50 ± 0.55 | 4.17 ± 0.98 | 3.83 ± 0.98 |
| Recorded only | 13 | 4.62 ± 0.51 | 4.23 ± 0.73 | 4.15 ± 0.38 | 3.85 ± 0.69 |
| Mixed (live + recorded) | 9 | 4.56 ± 0.73 | 3.89 ± 0.78 | 3.78 ± 0.83 | 3.44 ± 0.88 |

scheduling flexibility, clearer communication, and session length, which may represent barriers to broader participation. Proposed topics for future webinars (n = 28) revealed consistent interest in social media use, online safety, and parental strategies for digital guidance, aligning with current concerns in the literature. Taken together, these responses not only contextualize the quantitative findings but also underscore the need to design family-school initiatives that are responsive to both practical constraints and parents' expressed priorities.

Each webinar was evaluated based on perceived usefulness and impact on family practices. All sessions received average ratings above 4.0 on a 5-point Likert scale (Fig. 1). The "Online games" webinar achieved the highest overall ratings, indicating participants' interest in understanding online gaming behaviours and related risks. The "First Mobile Phone" and "Parental Digital Anxiety" sessions also stood out for their practical relevance and perceived impact on parental attitudes. This hierarchy mirrors international findings that these are among parents' primary areas of concern (Chaudron et al., 2018; Nikken & de Haan, 2015; Ofcom, 2023). Studies have shown that games and smartphones are often parents' first encounters with conflicts over autonomy and control in children's digital lives, which explains the strong resonance of these sessions (Beyens et al., 2019; Nikken & Schols, 2015). The high rating of the parental anxiety session further indicates that adults seek reassurance and community in managing their own emotions toward technology use.

Future areas of interest included: digital health and well-being, cyberbullying and online safety, regulation of screen time, artificial intelligence and education and adolescent mental health concerning digital use. Participants recommended enhancing communication and promotion, as well as introducing interactive elements, such as live Q&A Sessions or in-person options.

These outcomes align with the growing body of research showing that brief, topic-specific educational interventions can effectively raise awareness and trigger reflective change, even when participation is modest (Lynch & Redpath, 2014). The hybrid format proved especially valuable, supporting both flexibility and inclusion. Asynchronous

availability likely extended the intervention's reach beyond those captured in survey responses, an aspect common in school-based digital education initiatives (Leaning, 2019).

The relatively low response rate and participation rate nonetheless illustrate the persistent difficulty of engaging families in school-led digital literacy efforts. Similar challenges have been documented in large-scale European projects, where barriers such as limited time, competing priorities, and digital fatigue often restrict parental involvement (Smahel et al., 2020). Addressing these structural obstacles may require institutional commitment to sustained communication strategies and to integrating digital education into broader school culture.

Despite these constraints, participants' feedback underscored the intervention's feasibility and value. Respondents particularly appreciated the evidence-based, non-judgmental approach and the credibility added by pediatrician facilitators, whose professional expertise bridged educational and health perspectives. This multidisciplinary approach reflects the growing recognition that digital well-being requires shared responsibility among schools, families, and health professionals. The focus on hybrid delivery proved effective in extending access and accommodating diverse family routines and digital competencies, consistent with recommendations from recent digital education research.

Overall, the intervention demonstrates that brief, low-cost, and evidence-informed initiatives can foster meaningful dialogue between schools and families, even when participation is modest. The concise, thematic format and asynchronous availability made the program scalable and inclusive, offering a model adaptable to diverse educational contexts. The combination of scientific grounding and practical strategies helped participants translate abstract principles into everyday parenting and teaching practices. Aligning the content with internationally recognized frameworks ensured conceptual rigor and compatibility with established educational standards.

Comparable interventions in digital literacy and parental engagement have reported similar outcomes, reinforcing the relevance of brief, accessible, and hybrid models. Recent systematic and qualitative studies have demonstrated that concise, theme-based formats—such as short workshops, webinars, or school-led family sessions—can effectively raise awareness, stimulate reflection, and foster dialogue between educators and parents, even when participation rates are modest. Programs integrating digital citizenship education within school communities have been shown to enhance parental confidence, reduce digital anxiety, and promote consistent family-school communication about online behaviour and safety (Jones et al., 2024; Nikken & Schols, 2015). These findings support the feasibility of short-format interventions as sustainable and scalable approaches to digital education, particularly when grounded in recognized frameworks and delivered by trusted professionals. The present study builds on this evidence base, illustrating how a structured, pediatrician-led webinar series can translate international recommendations into a practical, context-specific model for school-family collaboration in digital well-being.

Nevertheless, several limitations should be acknowledged. The study relied on voluntary self-report data and lacked pre- and post-measures,

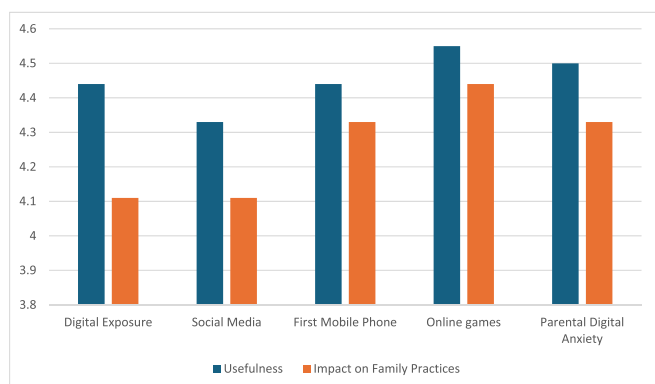


Fig. 1. Impact of each webinar (Likert Scale).

precluding assessment of actual learning gains or behavioral change. The small sample size and single-school context limit generalizability, and the absence of inferential analysis restricts interpretation to descriptive insights. Future implementations should aim to increase recruitment through systematic reminders, direct teacher involvement, and integration into school events that combine online and in-person elements. Incorporating validated instruments to measure digital literacy, parental self-efficacy, and attitudes toward technology would also strengthen the evaluation of outcomes.

From a practical standpoint, schools seeking to promote digital literacy should prioritize concise, topic-specific content, employ trusted facilitators, and ensure hybrid accessibility. Embedding such programs in annual school calendars and coupling them with student workshops could help build sustainable ecosystems of digital education. Expanding these initiatives across diverse educational settings and conducting longitudinal mixed-method studies would provide deeper insight into their sustained impact.

In conclusion, this study shows that short-format, evidence-informed digital literacy interventions can foster meaningful cooperation between schools and families by addressing concrete, high-stakes topics in children's digital lives. Strengthening partnerships between educators, families, and health professionals remains essential to nurturing the competencies, resilience, and empathy required for safe and informed participation in the digital world.

CRediT authorship contribution statement

Teresa Pinheiro: Writing – review & editing, Writing – original draft, Project administration, Methodology, Data curation, Conceptualization. **Ana Filipa Mouro:** Writing – review & editing, Methodology, Conceptualization. **Ilídia Cabral:** Writing – review & editing.

Ethics approval statement

This study involved an anonymous satisfaction survey administered to webinar participants. No personal or sensitive data were collected, and participation was voluntary. As such, ethical approval was not required according to the institutional and national ethical guidelines.

Consent for publication

Not applicable.

Declaration of the use of AI assisted technologies

The authors declare that they did not use AI or AI-assisted technologies for any part of the work related to the submitted manuscript.

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Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability statement

Data is available upon request.

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Further reading

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