

Introduction

Background: Digital-based education has gained significant attention in internet safety education research. (Zhang-Kennedy, & Chiasson, 2022).

Research aim: This study aims to analyze and map the literature concerning the trends and advantages of digital technologies in children's internet safety education research. Scoping reviews are well-established for exploring topics beyond the effectiveness or impact of interventions, making them particularly valuable for integrating literature from diverse fields (Peters et al., 2015)

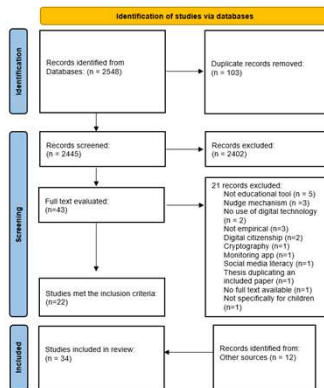
Research questions: This scoping review aims to address two primary research questions: a) How does digital technology facilitate online safety education for children? b) What barriers exist in the research on online safety education technologies?

Research Method

This scoping review is guided by the five-stage framework developed by Arksey and O'Malley (2005). We conducted searches in four electronic databases: ERIC, Web of Science, Scopus, and the Association for Computing Machinery [ACM].

The literature search resulted in **2548** studies that were uploaded to Rayyan (Ouzzani et al., 2016). Following the screening process, we included **34** peer-reviewed studies published in English between 2013 and 2022 in our review.

Figure 1. Prisma flowchart



FINDINGS

PUBLICATION DATE

61% of reviewed papers were published between 2019–2022 (n=21), while 13 papers were published on this topic between 2014 and 2018.



LOCATION

Most of the studies focused on Western and developed societies (10 from North America, 9 from Europe), while 9 studies did not specify their origin.



TECHNOLOGY

Game-based learning was prominent (n= 15). Apps and websites with educational material were developed too. E-books, digital storytelling, digital comics, and digital storyboards were included in 6 studies.



SAMPLE

Studies on children's behavior had sample sizes ranging from 6 to 978 participants, with ages ranging from 6 to 18 years old. Most studies focused on children between 11 and 18 years old.



RESEARCH DESIGN

The research included three types of study design: quantitative, qualitative, and mixed methods. Intervention-based approaches were utilized in 18 studies, while co-design was adopted in eight. Six studies used qualitative data collection strategies, such as interviews and observations.



CONTENT

Educational technologies and review papers cover a wide range of internet safety topics, including safe behaviors like not sharing personal information and avoiding contact with strangers. However, only a few studies address more complex internet safety issues.



Discussion

How does digital technology facilitate Internet safety education? Our analysis revealed a growing number of educational technologies designed for children's Internet safety education over the years. Among various approaches, **game-based learning** emerged as the most popular method for delivering educational content within the broader domain of Internet safety education. Technology-based educational games have proven to be effective tools for helping children grasp online safety concepts in a dynamic and captivating manner (Baciu-Ureche et al., 2019).

What barriers exist? One of the finding revealed that Intervention-based research designs were the most frequently employed methodology. However, the review reveals that there is a need for more rigorous research design to effectively evaluate the impact of technology interventions.

Limitation: This review did not undertake an exhaustive analysis of study findings, which restricts its capacity to draw conclusive insights for specific research inquiries. Therefore, it offers less comprehensiveness compared to systematic reviews or meta-analyses. Our review's scope might have been constrained to specific geographic regions or study designs, consequently, the relevance of our results in broader contexts could be limited.

Figure 2. Geographical distribution of studies (10 studies did not report the location)



Conclusion

This scoping review systematically uncovered key findings of 34 studies and identified areas where further work is needed in the field of digital learning technologies in children's Internet safety education.

Findings demonstrated that utilizing educational technology is an effective approach to enhance children's understanding of online security risks and impart safe internet usage practices. However, more rigorous intervention studies are need to evaluate the effectiveness of tech-based training in realm of children's cyber safety.

Our study advances the knowledge base on technology-based education in internet safety training of children by mapping the literature of this field and unveiling the trends over the past decade. These insights have the potential to shape **future research** directions in Internet safety education and inform the **educational technology industry**.

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