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Teacher and School Mediation for Online Risk Prevention and Management: Fostering Sustainable Education in the Digital Age

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Abstract: (1) Background: The increasing use of information and communication technologies (ICT) in educational environments has introduced new challenges related to digital safety and sustainability. Teacher mediation and institutional initiatives are pivotal for preventing and managing Internet-related risks. This study investigates teacher and school mediation strategies for online risk prevention, analysing differences across educational settings and stages in Spain to inform inclusive digital safety practices. (2) Methodology: a quantitative study was conducted using a cross-sectional survey design involving 550 elementary and secondary school teachers from both mainstream and special education schools. (3) Results: Most schools implement intervention plans to mitigate risks associated with students' Internet use, although the approach to these plans varies according to educational stage and school setting. Teachers employ strategies such as setting classroom rules and supporting students with online challenges, with secondary school teachers and those in mainstream schools tending to adopt more comprehensive or conversation-based prevention strategies. (4) Conclusions: Teachers and schools play a crucial role in ensuring digital safety and sustainability. Future efforts should strengthen digital skills, foster responsible online behaviour, and build inclusive, flexible learning environments according to the differing needs observed across stages and school settings.

Keywords: teacher mediation; online risk management; digital literacy; sustainable education; digital citizenship



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1. Introduction

The development of the digital environment has favoured innovation in the educational context, promoting the integration of Information and Communication Technologies (ICT) in teaching and learning processes [1]. This process has made teachers' digital competence a professional requirement and students' digital competence a central focus of new approaches to academic curricula [2,3]. However, ICT also poses challenges to educational opportunities, such as the potential online vulnerability of children [4,5]. This is because the use of the Internet, whether educational or personal, has led to the emergence of online risks that can affect the safety and well-being of students [6–8]. The dangers associated with Internet use can be grouped into four main areas: content, contact, behaviour, and contractual aspects [9]. Content risks include threats involving the exposure or dissemination of material unsuitable for minors, such as pornography, violence, or drug use. Contact risks include situations where a child could initiate or receive inappropriate interactions,

e.g., sexual harassment or grooming. Behavioural risks include inappropriate behaviour in the digital environment, such as cyberbullying, either as a victim or as an aggressor. Finally, contractual aspects cover exposure to misleading advertising, commercial manipulation, or misuse of personal data. Recently, a new, cross-cutting category has been added, which includes risks that can manifest themselves in any of the above areas, such as limited personal relationships, physical health problems, and the emergence of Internet addictions [9]. In this context, mediation by both teachers and schools takes on a strategic role in preventing and managing these risks, establishing a bridge between technological innovation, skills development, and the safety of minors [10]. However, this mediation from the educational sphere must be carried out in collaboration with the students' families in order to be effective [4]. Consequently, strategies must be developed that involve teachers, educational institutions, and families, promoting a culture of prevention and risk management that is articulated through digital literacy and digital competence training [11,12]. In light of this, this study examines how Spanish teachers and schools mediate online risk prevention through institutional plans and classroom strategies, and how these differ across educational stages and settings. This comparative approach seeks to identify whether institutional and teaching strategies for online risk prevention differ between mainstream and special education settings, which is crucial for promoting inclusive and sustainable digital education practices across diverse learning environments. In doing so, we also contribute to the ongoing international debate on the securitisation of education and the evolving role of teachers in the governance of digital risk [13,14].

The aim of this mediation is not only to ensure the safety and well-being of learners in digital environments, but also to build lasting and sustainable skills [15]. Thus, the sustainability of education in the 21st century is based on the ability to develop digitally competent and critical citizens who are able to function with autonomy and ethical commitment [16]. The European Digital Competence Framework for Citizens (DigComp) and the Digital Competence Framework for Educators (DigCompEdu) provide essential guidance in this process, integrating technical, cognitive, and ethical aspects, including those related to data protection, health, and digital well-being [17,18]. Consistent with the sustainable development goals of the 2030 Agenda, this vision of education calls for the formation of digital competences that promote the responsible use of technology and care for the environment [19,20]. Digital literacy thus combines the transmission of technical knowledge and skills with the integration of ethical, social, and emotional dimensions for the development of digital citizenship [21]. In addition to the teaching of this knowledge and these skills, teachers and schools need to carry out mediation, understood as the implementation of various training and prevention strategies modulated by a third party. Livingstone et al. [22] have established four main categories of Internet mediation strategies. First, there is active mediation, which involves shared activities and conversations about how children interact online. Secondly, restrictive mediation involves limiting access to certain content or even blocking Internet use in certain situations. Thirdly, monitoring refers to supervision, such as checking browsing history or e-mail. Finally, technical mediation uses tools such as blocking filters, anti-spam, and anti-virus software to control access to specific content. Currently, the combined use of active and technical mediation is often promoted as preferred actions, although restrictive mediation is still of significant value at certain ages. However, the priority should be to empower learners to identify and manage risks without sacrificing opportunities for learning and participation [23]. This positive risk management approach integrates safety and sustainability into digital learning, fostering autonomy and a sense of responsibility in learners [24]. Moreover, evidence suggests that early intervention leads to better outcomes in competence development [25].

Therefore, the integration of digital competence into the curricular framework is seen as a way of approaching the training of students for online safety [26,27]. In this regard, several studies have pointed out the importance of initial and ongoing teacher training in digital competences and mediation strategies, as this is a determining factor for the implementation of pedagogical practices that reduce the risks associated with Internet use [28–30]. However, beyond teaching skills, the development, implementation, and improvement of institutional policies and protocols are essential, as they form the foundation of online risk prevention [31,32]. This should be done while taking into consideration the evidence and good practices of school-based cybersecurity training programmes [28,29] and the importance of school culture in the effectiveness of teacher performance [33]. In this way, coordination between teachers, principals, families, and other social actors is an indispensable process for the development of responsible, safe, and resilient behaviours in students [29,34]. Moreover, throughout this whole process, the challenges experienced by people with special educational needs specifically in this area (e.g., digital divide, cognitive accessibility) should not be forgotten [5,35], which will require specific adaptations to promote their digital competence [36,37].

In this sense, the works of Sağlam et al. [38], Rahman et al. [39], and Aznar-Martínez et al. [40] coincide in highlighting the convenience of approaching student cybersecurity training in schools from multiple perspectives, with flexible methodologies that connect with the reality of children and teenagers. While Sağlam et al. [38] underline the current diversity of curricular approaches in this intervention, and the need to implement strategies that integrate both expert recommendations and the voices of students. Rahman et al. [39] emphasise the role of schools as resource and knowledge centres capable of disseminating good practices and raising awareness among the entire educational community. Aznar-Martínez et al. [40] stress the importance of involving families and teachers in a collaborative way, as well as paying attention to potential emerging risks arising from the rapid evolution of the digital environment, which are often overlooked. Taken together, their contributions reinforce the idea of comprehensive digital safety education that combines technical skills, ethical values, and intergenerational collaboration. Therefore, for effective intervention, it is essential that teachers are aware of the risks of the Internet and develop appropriate mediation strategies [41,42], based on a comprehensive approach to risk prevention in real life offline [28]. However, there is a lack of training for teachers on online safety [43,44], which underlines the urgency for them to acquire both technical and pedagogical skills in creating a school culture of cybersecurity [45–47].

On the other hand, the type of educational setting and the academic stage are important dimensions to consider in research on teachers' digital competence. Recent studies suggest that special education teachers and those working at initial levels, such as early childhood education, face difficulties related to digital mediation [48]. One of the factors contributing to this situation is the assumption that younger students are not as exposed to online risks, which may result in limited access to digital safety training for these teachers compared to secondary school teachers [49]. However, this assumption does not reflect the reality of today's world, where contact with the Internet occurs at a younger age and therefore informed guidance is needed to provide children with the protection and knowledge to be confident in the digital environment [50]. In fact, paradoxically, the acquisition of higher digital skills in students seems to indicate a tendency to expose themselves to more risks, so it is essential to deepen the impact of each dimension of digital competence on safety and consider the evolution of skills throughout childhood as a preventive measure to optimise benefits and reduce inequalities in the digital society [8].

Spain's education system operates under both national and regional governance. While there is a core national curriculum established by the Ministry of Education (Organic

Law 3/29 December 2020, amending Organic Law 2/3 May 2006, on Education [LOMLOE]) that all schools must follow, each of the 17 autonomous communities has the autonomy to adapt or supplement these guidelines. Furthermore, in line with European directives on digital education [26], Spanish legislation increasingly prioritises the development of digital competences and online safety skills across all levels of schooling. Mainstream schools typically serve the general student population, whereas special education schools focus on students with intense and permanent educational support needs, offering smaller class sizes and specialised support staff [51]. As regards digital literacy and internet safety, Spanish curriculum guidelines have increasingly highlighted “digital competence”, including basic references to online risk awareness. Individual regions implement these national directives with varying degrees of specificity. Teacher education at universities often incorporates ICT training, yet cybersecurity or safe internet use may only be briefly addressed [52]. Professional development for in-service teachers is commonly available, though not uniformly mandated [53]. In Spain, digital security is increasingly regarded as crucial in public discourse, with calls for more robust policy frameworks and initiatives aimed not only at safeguarding minors’ digital rights but also at protecting them from potential risks [54,55]. However, the extent to which schools incorporate structured intervention plans varies, particularly between mainstream and special education contexts. In the latter, heightened individual support needs can shape how internet use and digital literacy activities are introduced, thus potentially influencing the emphasis on safe and ethical digital practices. Therefore, understanding Spanish schools’ structures and policy frameworks is crucial to contextualise the teacher mediation strategies explored in this study [10]. Although progress has been made at the policy and curricular levels, further research is needed to understand how these frameworks are implemented in practice across diverse educational contexts in Spain, particularly regarding teacher mediation and institutional strategies for managing online risks.

However, despite the existence of prior research addressing teacher training and school mediation for safe Internet use, several gaps remain in the literature regarding how these practices vary across different educational settings (mainstream versus special education) and academic stages (early childhood and primary versus secondary). Many studies focus on either school-based cybersecurity programmes or teacher preparedness, yet they often omit a detailed analysis of learners with additional needs (for instance, in special education) or overlook contextual factors such as school policies and culture. Additionally, while some investigations have emphasised the effectiveness of restrictive or active strategies for risk prevention, they have not explicitly examined how such approaches are integrated into institutional protocols or how they may affect distinct student populations differently. The novelty of our study lies in a comparative, multifaceted exploration of (a) the implementation of Internet safety intervention plans at the institutional level, (b) the classroom mediation strategies employed by teachers, and (c) the influence of both educational stage (early childhood/primary vs. secondary) and setting (mainstream vs. special education) on these strategies. By simultaneously examining these three dimensions, our research provides a clearer understanding of the strengths and limitations in each context—mainstream and special education, early childhood, primary and secondary education. Moreover, by situating our work in the Spanish context, we address how this critical issue is being tackled in a specific national setting, thereby contributing valuable insight into both national and international efforts to promote safe and inclusive digital citizenship. This integrated perspective adds empirical evidence that can inform inclusive, context-specific policies to enhance digital safety and promote a sustainable educational environment. Previous studies have tended to isolate individual components of digital safety practice; in contrast, our comprehensive design offers new insights into how institutional

action plans, teacher strategies, and contextual variables intersect to shape effective and responsible digital citizenship.

Under this premise, this study investigates teacher and school mediation strategies for online risk prevention, analysing differences across educational settings and stages in Spain to inform inclusive digital safety practices. We anticipate that although teachers recognise the importance of schools in promoting students' online safety, there is limited practical implementation. Additionally, we expect more extensive intervention with secondary school students in mainstream education compared to those in early childhood, elementary, and/or special education settings. To this end, the following specific objectives and research questions were established:

- a. To find out and compare the relevance attributed by teachers to digital safety education in schools.
 - To what extent do teachers think the role of schools is relevant in students' online safety education?
 - Does the perceived importance of digital education vary depending on the educational stage and setting in which they teach?
- b. To identify and compare the existence and implementation of intervention plans for the prevention of online risks at schools.
 - Do schools implement intervention plans to prevent online risks for their students?
 - Does the implementation of intervention plans vary based on educational stage and school setting?
- c. To examine and compare the mediation strategies employed by teachers in the classroom for the prevention and management of Internet risks.
 - What digital mediation strategies do teachers use to prevent and manage online risks with their students?
 - Does the use of mediation strategies vary depending on the educational stage and setting in which they teach?

2. Materials and Methods

2.1. Study Design

In order to understand teachers' perceptions and practices in promoting safe Internet use in schools and classrooms, a descriptive and comparative non-experimental study based on a cross-sectional survey design was carried out. This type of research allows for the description of specific phenomena at a given time and within a particular context, without manipulating the variables under study [56].

2.2. Participants

The sample consisted of Spanish in-service teachers. The criteria for inclusion of respondents were as follows: (a) teaching at any educational stage (kindergarten, elementary, or secondary education); (b) teaching in either mainstream or special education schools; (c) working at public or private-subsidised schools; and (d) being from any geographical area of Spain. Selection was carried out using stratified probability and cluster sampling. The strata included the autonomous community (Spain has 17 autonomous communities and two autonomous cities), the educational setting of the school (mainstream or special education), and the educational stage (early childhood and elementary education or secondary education). The clusters were represented by the schools (elementary and secondary education).

In total, 607 questionnaires were returned. After excluding the incomplete ones ($n = 57$), the final sample consisted of 550 teachers, the majority of whom were women (71.1%), aged between 21 and 67 years ($M = 43.95$, $SD = 10.1$). Regarding the ownership of the schools, 61.6% of the participants worked in public institutions and 38.4% in private-subsidised schools. In relation to the educational setting, 277 teachers (50.4%) worked in mainstream schools and 273 (49.6%) worked in special education schools. Regarding the educational stage, 215 participants (39.1%) taught in early childhood and elementary education, while 335 (60.9%) taught in secondary education. The average teaching experience of teachers was 15.37 years ($SD = 10.2$).

2.3. Instruments

A questionnaire structured in three sections was designed: (a) Sociodemographic information, which collected data on the autonomous community, educational setting of the school, ownership of the school, educational stage, years of teaching experience, age, and gender. (b) The school strategies for mediating Internet risks included a question about teachers' perceptions of the role of schools in training students in online safety. This question had to be answered on a scale from 0 (nonrelevant) to 10 (completely relevant). A second question addressed whether or not intervention programs for safe internet use had been implemented, and a third question asked about the types of actions carried out (e.g., tutorial action programmes, setting rules, using control filters). (c) Teacher mediation strategies for internet risk prevention, in which participants were asked to indicate, using a 5-point Likert scale (1 = never, 5 = always), how often they employed 10 strategies to prevent online risks in students (e.g., talking to students about their online activity, setting rules, providing support when students encounter difficulties online, staying close to students when they use the internet, teaching students about how to use the internet responsibly). The internal consistency of this scale was assessed using Cronbach's Alpha coefficient, with a value of 0.93. For the content validity of the instrument, eight experts in education, ICT, and disability evaluated the instrument, resulting in a content validity index of 0.83 [57].

2.4. Procedure

An online version of the questionnaire was sent by e-mail to randomly selected schools. Along with the instrument, detailed information on the purpose of the study, its relevance, and instructions for completion were provided. A reminder was sent a fortnight after the first mailing. Given the low response rate, a second mailing was made after one month, this time by post, extending the return period by an additional month. The estimated time to complete the questionnaire was approximately 10 min.

2.5. Data Analysis

The process of coding the responses and analysing the data was carried out using IBM SPSS v. 28 statistical software. Percentages, means, and standard deviations were calculated to describe the characteristics of the sample and the responses to the items. Parametric (two-way ANOVA) and non-parametric (chi-square) inferential statistics were used to compare groups, with a significance level of $p < 0.05$.

2.6. Ethical Considerations

Approval of the research was requested from the Ethics Committee of University of Alicante (procedure UA-2022-10-28). The study was conducted following the principles set out in the Declaration of Helsinki and the ethical guidelines of organisations such as the American Educational Research Association [58]. As part of the ethical measures, detailed

information about the research and its objectives was provided, informed consent was requested from participants, and confidentiality and anonymity of responses were assured.

3. Results

The findings address the research questions and are presented in the following sections, organised according to the three specific objectives.

3.1. Relevance of Schools in Digital Safety Training for Learners

In general, teachers attribute a relevant role to schools in the online safety education of students, with a mean rating of 8.42 ($SD = 1.59$) on a scale from 0 to 10. To determine the differences in teachers' perceptions based on educational stage (variable A) and school setting (variable B), a two-factor ANOVA was carried out, and statistically significant differences were observed in the interaction of these two variables [$F(1, 546) = 8.69, p = 0.003$, partial eta squared = 0.016]. Table 1 displays the means and standard deviations for the four subgroups of teachers, as well as the main effects of the two variables (A, B) and their interaction ($A \times B$). Early childhood and elementary school teachers in special schools ($M = 8.83, SD = 1.29$) gave greater importance to the role of schools in the digital safety training of students than early childhood and elementary school teachers in mainstream schools ($M = 8.01, SD = 1.87$) and than secondary school teachers in mainstream schools ($M = 8.40, SD = 1.57$) and special schools ($M = 8.41, SD = 1.55$). Statistically significant differences were also observed in the main effect of the educational setting variable [$F(1, 546) = 9.17, p = 0.003$, partial eta squared = 0.017], with a higher evaluation of the relevant role of schools by teachers in special education schools ($M = 8.58, SD = 1.46$) than in mainstream schools ($M = 8.25, SD = 1.70$). The main effect for the educational stage variable did not reach statistical significance ($p > 0.05$).

Table 1. Perceived differences in the importance of schools in students' digital safety education (two-way ANOVA).

Variable	General Education School		Special Education School		Two-Way ANOVA			
	M	SD	M	SD	Effect	F(1, 546)	p	η^2
Importance of schools in digital safety education					A	0.01	0.925	0.000
Early childhood/Elementary education	8.01	1.87	8.83	1.29	B	9.17	<0.003	0.017
Secondary education	8.40	1.57	8.41	1.55	$A \times B$	8.69	0.003	0.016

Note: N = 550. A = Educational stage; B = Educational setting; $A \times B$ = interaction of educational stage (A) and educational setting (B).

3.2. Intervention Plans in Schools for Mediation in the Safe Use of the Internet by Students

Overall, 63.1% of the participants stated that they had some kind of intervention plan in place at their schools to prevent or manage the risks of the Internet for students. According to these teachers, the most frequently used strategies included actions carried out within the framework of the tutorial action programme (86.2%) and the establishment of rules at the school for Internet use (67.6%), as well as allowing the use of mobile devices only for educational activities, the use of content control filters, access control, or antivirus programmes (57.3%), among others.

The chi-square test (with Yates' continuity correction) revealed a statistically significant association between the existence of intervention plans in schools and educational stage, $\chi^2(1, n = 550) = 3.86, p = 0.049, phi = 0.040$. Specifically, early childhood and elementary school teachers (68.4%) reported having these programmes in their schools to a greater extent than secondary school teachers (59.7%). With respect to the specific actions developed, only one statistically significant relationship was found regarding the use of mobile devices

for exclusively educational purposes, $\chi^2 (1, n = 349) = 13.65, p < 0.001, \phi = -0.204$, with secondary education teachers (66%) claiming a greater implementation of this measure by the school than early childhood and elementary education teachers (45.6%).

On the other hand, no statistically significant association was observed between the implementation of intervention plans and the educational setting, $\chi^2 (1, n = 550) = 0.50, p = 0.824, \phi = -0.013$. However, statistically significant relationships were identified with respect to the implementation of specific actions within the framework of the tutorial action plan, $\chi^2 (1, n = 349) = 7.09, p = 0.008, \phi = 0.151$, being higher in the case of mainstream schools (91.4%) than in special education schools (81.0%). The same trend was observed for the use of content control filters, access, and anti-virus software, $\chi^2 (1, n = 349) = 3.97, p = 0.046, \phi = 0.113$, where the proportion was higher in the case of mainstream schools (62.9%) compared to special schools (51.7%).

3.3. Teaching Strategies for the Prevention and Management of Internet Risks

Finally, we analysed the mediation strategies that teachers use in the classroom to prevent and manage online risks. The most frequently used strategies are offering help to students if they have difficulties in doing something or locating information on the Internet (83.5%), setting rules for Internet use (79.5%), and staying close to students when using the Internet (71.8%). Slightly more moderate is the use of strategies such as teaching students safe ways to use the Internet (61.8%), teaching them how to behave appropriately online (65.3%), talking to them about which websites are appropriate and which are not (61.3%), or about certain risks of the Internet such as cyberbullying, accessing inappropriate content, misleading advertising (61.3%), and helping a student if they encounter a problem on the Internet (65.3%). On the other hand, the mediation strategy least used by teachers is talking to students about what they do online (41.5%). Table 2 shows the means and standard deviations of each of the teacher mediation strategies disaggregated by educational stage and educational setting.

Table 2. Descriptive statistics for teacher mediation strategies for the prevention and management of Internet risks by educational stage and educational setting of the school.

	Educational Stage				Educational Setting			
	Early Childhood/ Elementary Education		Secondary Education		General Education School		Special Education School	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
1. Talk about what they do on the Internet.	2.93	1.29	3.28	1.05	3.21	1.04	3.07	1.27
2. Stay close to the students when they use the Internet.	3.85	1.33	3.86	1.13	3.73	1.15	3.99	1.26
3. Set classroom rules for Internet use.	3.91	1.33	4.30	0.94	4.29	0.95	4.00	1.26
4. Offer help to students if they have difficulties in doing something or locating information on the Internet.	4.03	1.39	4.45	0.85	4.31	1.00	4.27	1.21
5. Teach students safe ways to use the Internet.	3.41	1.40	3.84	1.10	3.73	1.13	3.61	1.35
6. Teach students how to behave appropriately online.	3.49	1.46	3.92	1.09	3.82	1.13	3.68	1.38
7. Talk about which websites are appropriate and which are not.	3.30	1.44	3.77	1.11	3.68	1.10	3.50	1.42
8. Talk to them about certain risks on the Internet (e.g., cyberbullying, data theft).	3.21	1.42	3.83	1.07	3.73	1.14	3.44	1.35
9. Teach students what to do if they are worried about something happening to them on the Internet.	3.12	1.43	3.59	1.18	3.52	1.22	3.29	1.38
10. Help students if they have had any problems on the Internet.	3.52	1.45	3.93	1.22	3.84	1.24	3.70	1.40

Successive two-way analyses of variance (ANOVA) were carried out to analyse the effects of educational stage (variable A) and educational setting (variable B) on the use of the different teacher mediation strategies. Table 3 shows the means and standard deviations

for the four subgroups of teachers, as well as the main effects of the two variables (A, B) and their interaction ($A \times B$). The analysis revealed statistically significant interactions between both independent variables in all the strategies analysed ($p < 0.05$), except in the establishment of classroom rules for Internet use, where statistical significance was not reached ($p > 0.05$). Secondary school teachers in special schools reported more frequent implementation of various strategies compared to early childhood and elementary school teachers in the same schools. These strategies include the following: talking to students about their Internet activities, offering help when they face difficulties, teaching safe ways to navigate and behave online, and recommending appropriate websites. On the other hand, secondary school teachers in special schools reported more frequent use of the strategy of staying close to students while using the Internet compared to their secondary school peers in mainstream schools. Also, regarding the strategy of talking to students about the risks of the Internet, it was found that secondary school teachers in mainstream schools implement it more frequently than early childhood and elementary school teachers in special schools.

Table 3. Descriptive statistics and two-factor ANOVA for the interaction of educational stage and educational setting in the use of teacher mediation strategies.

	General Education School		Special Education School		Effect	Two-Way ANOVA		
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		<i>F</i> (1, 546)	<i>p</i>	η^2
1. Talk about what they do on the Internet.					A	12.34	<0.001	0.022
Early childhood/Elementary education	3.18	1.08	2.73	1.44	B	3.09	<0.001	0.006
Secondary education	3.26	1.02	3.30	1.09	$A \times B$	4.46	0.035	0.008
2. Stay close to the students when they use the Internet.					A	0.01	0.924	0.000
Early childhood/Elementary education	3.86	1.09	3.84	1.53	B	3.98	0.046	0.007
Secondary education	3.64	1.18	4.08	1.04	$A \times B$	4.56	0.033	0.008
3. Set classroom rules for Internet use.					A	15.65	<0.001	0.028
Early childhood/Elementary education	4.17	1.05	3.66	1.52	B	11.41	<0.001	0.020
Secondary education	4.37	0.88	4.23	1.00	$A \times B$	3.60	0.058	0.007
4. Offer help to students if they have difficulties in doing something or locating information on the Internet.					A	19.98	<0.001	0.035
Early childhood/Elementary education	4.22	1.15	3.84	1.57	B	0.96	0.327	0.002
Secondary education	4.36	0.89	4.55	0.78	$A \times B$	8.64	0.003	0.016
5. Teach students safe ways to use the Internet.					A	15.53	<0.001	0.028
Early childhood/Elementary education	3.71	1.21	3.13	1.51	B	3.33	0.068	0.006
Secondary education	3.74	1.07	3.93	1.13	$A \times B$	13.04	<0.001	0.023
6. Teach students how to behave appropriately online.					A	15.15	<0.001	0.027
Early childhood/Elementary education	3.72	1.26	3.28	1.61	B	3.03	0.082	0.006
Secondary education	3.89	1.05	3.95	1.13	$A \times B$	5.35	0.021	0.010
7. Talk about which websites are appropriate and which are not.					A	18.19	<0.001	0.032
Early childhood/Elementary education	3.58	1.18	3.04	1.62	B	4.66	0.031	0.008
Secondary education	3.74	1.04	3.80	1.19	$A \times B$	7.75	0.006	0.014
8. Talk to them about certain risks on the Internet (e.g., cyberbullying, data theft).					A	33.39	<0.001	0.058
Early childhood/Elementary education	3.52	1.25	2.91	1.52	B	10.58	0.001	0.019
Secondary education	3.87	1.05	3.79	1.10	$A \times B$	6.29	0.012	0.011
9. Teach students what to do if they are worried about something happening to them on the Internet.					A	17.25	<0.001	0.031
Early childhood/Elementary education	3.45	1.28	2.80	1.50	B	7.24	0.007	0.013
Secondary education	3.56	1.18	3.62	1.19	$A \times B$	10.11	0.002	0.018
10. Help students if they have had any problems on the Internet.					A	12.97	<0.001	0.023
Early childhood/Elementary education	3.74	1.27	3.30	1.57	B	2.61	0.107	0.005
Secondary education	3.90	1.23	3.96	1.21	$A \times B$	4.68	0.031	0.009

Note: N = 550. A = Educational stage; B = Educational setting; $A \times B$ = interaction of educational stage (A) and educational setting (B).

The main effects analysis showed that the educational stage has a significant effect on the use of all teaching mediation strategies ($p < 0.05$), except for the strategy of staying close to students when using the Internet, where statistical significance was not reached ($p > 0.05$). In general, secondary school teachers reported implementing these strategies more frequently than early childhood and elementary school teachers (see Table 2).

On the other hand, educational setting had a significant effect on some teaching strategies for mediating Internet risks. In particular, teachers in mainstream schools reported using the following strategies more frequently: talking about what students do on the Internet, setting classroom rules for Internet use, talking about which websites are appropriate and which are not, talking about certain Internet risks, and teaching students what to do when they are worried about something happening online. On the other hand, regarding the strategy of staying close to students when using the Internet, teachers in special schools reported implementing it more frequently than teachers in mainstream schools.

4. Discussion

The purpose of this study was to examine how Spanish schools and teachers mediate online risk prevention through institutional intervention plans and classroom strategies. It also analysed how these practices vary across educational stages (early childhood/primary vs. secondary) and settings (mainstream vs. special education). This analysis aims to provide a holistic view of how institutions and academics are addressing the challenges posed by the digital environment, and how these practices can contribute to a sustainable and safe education model, in line with frameworks such as DigComp and the Sustainable Development Goals of the 2030 Agenda [18,19]. This section discusses the results in relation to the study's three specific objectives, which focused on: (1) the perceived relevance of the school in digital safety education; (2) the existence and characteristics of school-wide intervention plans; and (3) the mediation strategies used by teachers to prevent and manage online risks.

In relation to the first research objective, which examined the institutional relevance attributed to digital safety education, the findings indicate that teachers recognise the fundamental importance of schools in the digital safety training of students. It is noted that, in general, teachers value positively the work of the institution as a guarantor of responsible ICT use, constituting the environment in which rules and policies that promote cybersafety are established and applied. This recognition is particularly relevant at institutions that cater for students with specific needs, as in these contexts there is a greater demand for institutional involvement and support. These findings are consistent with previous studies that have shown that a strong and diverse school culture is essential to sustain inclusive cybersecurity policies [29,32]. The involvement of schools goes beyond the simple availability of resources; it is about generating an educational environment in which digital safety is integrated as a shared value and is considered part of the integral educational process [28]. In contexts where the student population presents greater vulnerabilities, the role of the school is crucial to implement effective preventive strategies. This institutional perspective, which emphasises collaboration and collective commitment, coincides with the view that protection and competence development must go hand in hand to achieve sustainable digital education [18].

Regarding the second objective, which focused on the presence of school-wide intervention plans for online safety, results show that a significant percentage of schools have taken initiatives aimed at developing students' digital skills and mediation. The results indicate that these initiatives are mainly manifested in the framework of tutorial action and in the establishment of rules governing Internet use in the classroom and at school. However, it was found that the frequency and focus of these plans vary according to the educational stage. In early childhood and elementary education, there is a tendency to implement preventive strategies in a more proactive way, while in secondary education, more restrictive measures are prioritised, mainly oriented towards the control of devices and the use of technical tools such as content filters and antivirus. This difference may be explained by the perception that secondary school students are exposed to a more complex digital

environment and therefore require more rigorous control mechanisms. However, such a restrictive approach may limit learning opportunities and the development of autonomous digital skills [24]. These findings are in line with studies that have highlighted the need to integrate tutorial action plans and school policies that are flexible and adapted to the digital maturity of students, promoting both risk prevention and fostering participation and self-regulation, in collaboration with families [20,59]. Consequently, it highlights the importance for schools to review and adapt their intervention plans according to the available evidence, so that they are inclusive and adapted to the needs of each educational stage, thus ensuring that all students, regardless of their age or particular context, have access to digital safety training that combines preventive and continuous training measures [28,29,43].

Concerning the third objective, related to the specific mediation strategies adopted by teachers, the data reveal that, in general terms, intensive use is made of restrictive measures such as the establishment of rules and direct supervision of students' Internet use. These practices immediately reduce exposure to risky content and situations, but at the same time, there is less implementation of strategies based on dialogue and reflection, such as specific conversations about the risks of the Internet or guidance on how to act in situations of cyberbullying or digital manipulation. This imbalance between restrictive and formative mediation suggests that, while the former are effective in reducing the risk of exposure to inappropriate content, they may limit the development of critical and self-regulatory skills in students. In other words, there is a risk that over-emphasising control may impede active learning and the building of digital competences that allow students to autonomously manage the risks they face online. This conclusion is consistent with the literature that advocates balanced mediation, where risk prevention is accompanied by initiatives that promote reflection, awareness, and the ability of learners to act responsibly in the digital environment [23,47]. Furthermore, it is noted that the strategies adopted vary according to the educational setting. In mainstream schools, for example, there is a greater tendency to use approaches involving discussion and analysis of content, while in special schools, direct supervision is favoured, reflecting the need to adapt interventions to the specific characteristics of the students. These findings suggest the urgency of developing mediation models that combine restrictive and formative measures, allowing educational intervention not only to protect, but also to enhance the development of digital competences that contribute to student safety and autonomy, highlighting the need to strengthen teacher training on online safety [29,47,53]. This differentiated use of mediation strategies reinforces the importance of designing inclusive digital safety practices that are sensitive to the support needs of each educational context, particularly in special education settings, where a more personalised approach may be necessary to ensure both safety and equity in digital learning.

While this study explores how teachers and schools in Spain contribute to fostering a culture of digital security, it is important to situate this analysis within the broader academic debate on the securitisation of education, a concept that, in the Spanish context, relates to the approach to comprehensive school security and the learning of personal, social, and citizenship skills. Currently, the main areas of focus in Spanish schools, with which the National Police collaborate, are Internet risks, bullying, gender-based violence, youth gangs, drugs, and alcohol [60]. As Ghosh argues [14], the increasing incorporation of security agendas into educational spaces raises critical questions about the transformation of schools from places of empowerment into instruments of national and global security policies. Similarly, Bryan et al. [13] highlight how teachers are increasingly positioned as frontline security agents in response to threats such as radicalisation, cyberviolence, or ideological extremism. This shift brings with it tensions between educators' pedagogical roles, built on trust, care, and inclusion, and the more surveillance-oriented logic embedded in security

policies. Although the present study does not examine how Spanish teachers perceive these emerging responsibilities, future research should consider whether educators embrace their role in promoting online safety or view it as an added burden disconnected from their core mission. Exploring this dimension would contribute to understanding how security discourses are internalised, resisted, or negotiated in different educational contexts, and whether the expansion of school responsibility into digital risk management supports or undermines the democratic and inclusive ethos that education aims to uphold.

4.1. Recommendations for Practice

The results of this study offer important guidelines for educational practice. Firstly, it is essential that schools design and implement comprehensive intervention plans adapted to the characteristics of their students, which include both technical control measures and training strategies aimed at developing digital skills. Coordination between teachers, principals, and families should be strengthened to ensure that these initiatives are applied in a coherent manner and that a culture of digital safety is fostered that cuts across all educational stages. In addition, continuous teacher training in digital skills, especially in areas related to cybersecurity and online mediation, is crucial to ensure the effectiveness of these practices [47,61]. It is recommended that training programmes incorporate theoretical and practical components that enable teachers to gain an in-depth understanding of the risks of the digital environment and to develop intervention strategies that promote self-regulation and resilience in students. Similarly, it is important to adapt training to the specific needs of special education teachers, who often face greater challenges in mediating digital risks in a context of functional diversity [10,48,62]. Finally, it is essential that institutional policies and security protocols are regularly updated, ensuring that they adapt to changes in the digital environment and new learner needs [23,25]. The integration of these measures into the curriculum and daily school practice will strengthen teachers' capacity to deal with online risks, promoting safe and sustainable learning environments [17].

4.2. Limitations and Future Research Directions

Despite the contributions of this study, there are some limitations to be considered when interpreting its results. Firstly, the use of self-report questionnaires may lead to biases in the perception of teaching practices, which may differ from the reality observed in the classroom. In addition, there is a possibility that teachers overestimate the use of mediation strategies [61]. Moreover, the sample is restricted to Spain, which makes it difficult to generalise the results to other geographical or educational contexts. Another important limitation is the absence of the perspective of students and families, key elements for evaluating the use and/or effectiveness of digital safety interventions. Incorporating the vision of these actors in future studies would allow for a more holistic and accurate evaluation of the practices implemented. Furthermore, this study was based on a cross-sectional design, which prevents the verification of possible changes in the mediation strategies and intervention plans employed over time. To overcome these limitations, it is recommended that future research adopt a longitudinal approach, combining quantitative and qualitative methods including direct classroom observations, in-depth interviews, and focus groups with teachers, students, and families, including analysis from a gender perspective. This will allow for a more comprehensive evaluation of the use and effectiveness of interventions, and to detect possible changes in the perception and practice of mediation. Furthermore, it is suggested to extend the sample to different regions and educational contexts, paying specific attention to differences between mainstream and special schools.

5. Conclusions

This study shows that both schools and teachers play a crucial role in promoting digital safety and preventing risks associated with students' Internet use. The results show that the implementation of intervention plans and mediation strategies varies according to the educational stage and type of school, which underlines the need to adapt interventions to the specific characteristics of each environment. The inclusion of both mainstream and special education contexts provides valuable insight into how digital safety strategies can be adapted to support educational equity. Furthermore, the importance of continuous and comprehensive teacher training in digital competences, combining restrictive and active approaches, and articulated in a collaborative framework between school and families, is highlighted. These contributions reinforce the idea that the creation of safe and sustainable learning environments requires coordinated action and the constant updating of policies and protocols, which contributes to the development of competent, responsible, and resilient digital citizens, capable of facing the challenges of the digital age. Practical implications and recommendations for future research suggest the need to deepen mediation processes and explore contextual differences more broadly, in order to optimise the effectiveness of interventions and contribute to inclusive and sustainable education.

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