

Review

To Ban or Not to Ban? A Rapid Review on the Impact of Smartphone Bans in Schools on Social Well-Being and Academic Performance

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Abstract: The effects of smartphone use by children and young people, especially at school, are being discussed around the world. To support this discourse with scientific evidence, this systematic review is guided by the PRISMA framework and examines the effects of smartphone bans in schools on academic performance and social well-being. As a rapid review, it follows a streamlined methodology in order to provide a scientifically sound basis for educational policy decisions as quickly as possible. After a comprehensive database search, five research studies with quantitative results were selected and analyzed, and the effect sizes were calculated in the areas of academic performance and social behavior. The meta-analysis yielded an overall effect size of $d = 0.162$ ($p < 0.05$). Smartphone bans have a significant, but modest, effect. This is more pronounced in the domain of social well-being than in the performance domain. Smartphone bans can reduce social problems, such as bullying. The small effect on academic performance might be due to the limited number of studies and effects. We recommend that smartphone bans be introduced in schools, accompanied by educational measures, and evaluated regularly. This can improve the social climate and reduce potential distractions in the classroom. Further research is needed to better understand the long-term effects on academic performance. The aim of a smartphone ban should be to prevent the misuse of these devices, for example, as a tool for bullying classmates, and to prevent their negative impact on learning processes. Alongside the bans, responsible use of the technology and an understanding of its potential should be taught. Ideally, a level of media literacy is achieved that makes a smartphone ban superfluous.

Keywords: smartphone ban; schools; academic performance; social well-being; rapid review; meta-analysis



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1. Introduction

The use of cell phones, especially smartphones, has increased considerably over the last ten years, including among children and young people [1]. At the same time, the presence of cell phones in schools and classrooms has also increased [2]. This is not without consequences and poses numerous challenges for teachers, school administrators, and political decision-makers. On the one hand, digital media devices, including smartphones, have many positive properties that can optimize learning processes. The COVID-19 pandemic, in particular, has shown how learning success can be achieved through targeted pedagogical use. Digital media can individualize learning processes, enable new forms of collaboration, help to obtain and provide feedback, and can relieve the burden on teachers [3,4]. On the other hand, however, there are numerous indications that the use of digital media not only hinders learning processes, but can even prevent them. The smartphone in particular is the focus of numerous studies [5].

The presence of smartphones can have a negative impact on cognitive performance [6,7]. The devices can negatively influence learning processes. For example, the use of smartphones

in the classroom leads to a reduction in learning performance and poorer results in examinations [8]. Smartphone use can affect various areas of cognition, such as attention, memory, and reward deferral [9]. A meta-analysis of 39 studies from 14 countries showed that smartphone use by students has a negative impact on educational outcomes, such as test scores, grade point average, laboratory test performance, and self-rated academic performance [10]. However, the use of smartphones can not only affect the cognitive performance and thus the academic performance of learners; the consequences of using this technology are also evident in the social sphere.

Smartphone use can also have an impact on social and emotional well-being. According to Ryff and Singer [11], social well-being is a critical aspect of psychological well-being, highlighting the importance of positive social relationships and social support in maintaining mental health and overall well-being. Wang et al. [12] found that social well-being can be negatively affected by cyberbullying. Smartphones in particular and their functions, such as instant messaging and social media apps, are often misused by pupils for cyberbullying [13]. Cyberbullying is considered a serious problem by school officials in the USA, for example [14]. Apart from cyberbullying, smartphones can also lead to other social problems in schools. Studies suggest that smartphone-enabled social media use by minors is associated with depression and an increased risk of suicide [1,15,16]. Studies have also shown that high smartphone use is associated with increased loneliness and social isolation in young people. Young people who spend a lot of time on their smartphones often have fewer direct social interactions, which can affect their sense of connection and social well-being [1]. Due to these negative consequences of smartphone use, it is obvious that smartphone bans are being considered by education policy makers. Countries such as France, Spain, and Switzerland have introduced a ban on smartphone use in schools. A 2023 UNESCO report found that, of more than 200 countries, less than a quarter have such a ban [17]. The OECD speaks of more than a dozen countries with a smartphone ban [4].

The OECD also warns of the negative consequences of the presence of smartphones in the classroom. Both negative effects on performance and a high potential for distraction in the classroom are noted. Increased screen time is also linked to symptoms of anxiety and depression in young people [4]. When smartphones are banned in schools by education policy, this is often based on subjective beliefs and not on scientific evidence [18]. This rapid review aims to address this issue by providing both a comprehensive overview of the current research landscape and a calculated overall effect of smartphone bans, even though it is based on an analysis of only five studies.

2. Method

This article presents a rapid review. A rapid review is a form of knowledge synthesis in which the methodological steps of a traditional review are deliberately simplified or omitted [19]. This allows it to be produced quickly and in a resource-efficient manner [20]. With reference to the recommendations of Tricco et al. [21], this rapid review is based on various work steps, which are reflected in the structure of this study.

2.1. Research Question and Hypotheses

The research findings presented above indicate that smartphones can have an impact on both academic performance and social aspects of human interaction. This makes the issue of potential smartphone bans for schools particularly relevant. This study aims to answer the question of what specific effect smartphone bans have on academic performance and the social climate in schools. Based on the general findings on the negative effect of smartphones on cognitive performance and social aspects, positive effects of bans are expected for both domains. Accordingly, two hypotheses to be tested were formulated.

H1: *A smartphone ban leads to an improvement in students' academic performance.*

H2: *A smartphone ban leads to an improvement in the social climate among students.*

2.2. Literature Search and Study Selection

The PsycInfo and Google Scholar databases were searched to identify studies whose results were relevant to the present research. The literature search began in October 2023 and concluded with a final analysis conducted between 20 May and 30 May 2024. Initially, a broad operationalization of keywords was chosen to ensure comprehensive coverage [22]. The search terms chosen were: (mobile phone OR cell phone OR smart phone OR cellphone OR smartphone OR phone OR mobile device) AND (school OR education OR class) AND (bullying OR cyberbullying OR harass OR mental health OR anxiety OR depression OR well-being OR well being OR achievement OR learn OR attention OR distract OR disrupt OR cheat OR addiction) AND (ban OR restrict OR policy OR rule) NOT (university OR undergraduate).

These specific combinations were chosen to ensure that studies dealing with smartphone use and its effects in the school context were included. The use of “OR” within the brackets allowed for the inclusion of synonyms and related terms to ensure a broad and comprehensive search. The use of “AND” between the brackets ensured that only studies that covered all relevant aspects (cell phone use, school context, effects on behavior and well-being, and regulations on use) were included. Finally, “NOT” excluded studies on colleges and universities from the analysis, as these were not relevant to the present study. This structuring and the explanation of the logical operators ensured that the search was precise and included all relevant studies, while irrelevant results were excluded.

2.3. Study Selection

The search was initially deliberately broad so that studies relevant to the research questions could be identified in a multi-stage process (Figure 1).

In the first step, 3241 articles were identified. After excluding duplicates and articles that did not explicitly address schools, 310 articles remained. The focus was then sharpened with regard to title, abstract, and full-text review.

2.4. Title, Abstract, and Full Text Review

The aim of this study was to examine the effect of smartphone bans. Consequently, only studies investigating the effect of smartphone bans in schools were shortlisted, leading to the exclusion of a further 284 articles. A full-text analysis was conducted on the remaining 26 articles in order to be able to perform the corresponding calculations. For this rapid review, studies had to report quantitative results. However, numerous studies used qualitative research methods whose results could not be expressed in effect sizes [23]. In addition, some studies with quantitative results did not provide sufficient information to calculate effect sizes. For example, no standard deviations were reported in Guldvik and Kvinnsland [24]. Additional studies were removed. Ultimately, five research studies met all criteria and were, therefore, selected for further analysis (Table 1).

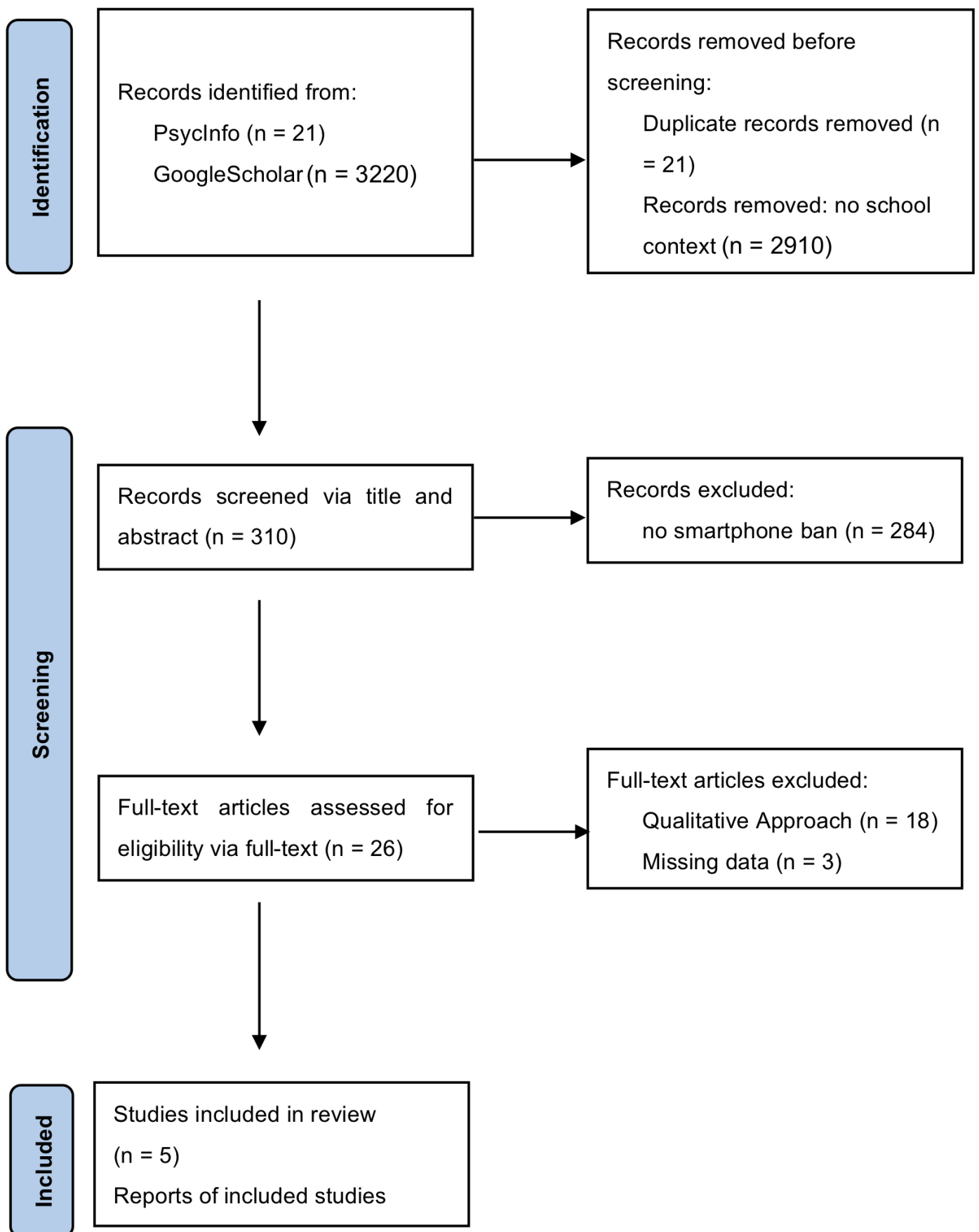


Figure 1. PRISMA flow chart.

Table 1. Studies and effects for calculating the meta-analysis by area.

Abbreviated Title (Year)	Authors	Research Area	Reference	n	d	SE	p	Weighting (%)	95% CI
Distraction or teaching tool (2020) [25]	Abrahamsson	Social well-being	Bullying	151,925	0.36	0.28	0.20	2.79	[−0.19; 0.91]
Banning mobile phones in schools (2021) [26]	Beneito and Vicente-Chirivella	Social well-being	Bullying age 12–14	84	0.36	0.20	0.07	5.12	[−0.03; 0.75]
			Bullying age 15–17	84	0.47	0.18	<0.05	5.73	[0.11; 0.83]
Effect of mobile phone ban (2020) [27]	Cakirpaloglu, Čech, Maléřová, and Adámková	Social well-being	Satisfaction	832	0.12	0.10	0.23	13.82	[−0.08; 0.31]
			Conflicts	832	0.20	0.12	0.09	11.20	[−0.03; 0.43]
			Competition	832	0.20	0.11	0.07	12.36	[−0.01; 0.41]
			Overall effect ‘social well-being’	-	-	0.22	0.06	<0.01	-
Distraction or teaching tool (2020) [25]	Abrahamsson	Performance	Grade point average	151,925	0.11	0.06	0.07	21.10	[−0.01; 0.23]
Ill Communication (2016) [28]	Beland and Murphy	Performance	Test performance	130,482	0.06	1.00	0.95	0.24	[−1.90; 2.02]
Impact of banning mobile phones (2020) [29]	Kessel et al.	Performance	Test performance	9371	0.01	0.03	0.66	27.64	[−0.05; 0.07]
			Overall effect ‘performance’	-	-	0.05	0.05	0.30	-

Notes: n = number of observations. d = Cohen’s d. SE = standard error. CI = confidence interval.

2.5. Data Extraction

The five selected studies contained quantitative results, on the basis of which effect sizes and standard deviations could be calculated. A total of three effects provided information about the impact of a smartphone ban on pupils' academic performance. Kessel et al. [29] reported results from national mathematics tests. Beland and Murphy [28] based their calculations on the results of final exams and Abrahamsson [25] based the calculations on teachers' grades. The effects and standard errors were read from graphical representations. Six effects shed light on the connection between smartphone bans and aspects of social well-being, such as bullying. Cakirpaloglu, Čech, Maléřová, and Adámková [27] reported three effects of the impact of smartphone bans on student satisfaction, conflict, and competition. The studies by Abrahamsson [25] and Beneito and Vicente-Chirivella [26] reported a total of three effects related to bullying. Based on the quantitative data reported in the studies, effect sizes and the associated standard errors were calculated (Table 1).

2.6. Risk of Bias Assessment

To reduce bias in this study, risk of bias assessments were conducted [30]: Abrahamsson [25] used a natural experimental design with schools introducing smartphone bans at different times, rather than using true randomization. School performance and bullying data, based on objective sources, ensured some objectivity. Confounders like policy changes and different implementation periods were accounted for. Overall, the risk of bias was moderate. Beneito and Vicente-Chirivella [26] used data from Spanish regions with and without smartphone bans, employing control procedures and a difference-in-differences analysis. Selection bias is possible due to non-random assignment. PISA results and bullying data were considered, though incomplete data from Castilla La Mancha affected comparability. Regional and time-dependent variables were controlled for, resulting in a low risk of bias. Kessel et al. [29] used data from Swedish schools with a 76% response rate, minimizing selection bias. Variability in smartphone policies across schools could have affected the results. Performance data from mandatory national tests reduced recording bias. The study covered the period from 1997 to 2017, with minimal bias from missing data, leading to a low risk of bias. Beland and Murphy [28] used data from England's National Pupil Database with a difference-in-differences approach. Implementation variability could have influenced the results, but controlling for student characteristics minimized this effect. Standardized test scores from independent authorities reduced detection bias. Robustness checks and a long study period spanning several school years resulted in a low risk of bias. Cakirpaloglu, Čech, Maléřová, and Adámková [27] compared schools with and without cell phone bans, but did not control for confounders like socioeconomic status. The study examined 56 classes with different cell phone policies, using a standardized questionnaire to assess classroom climates. The selection process was unclear, and missing values were not addressed. Overall, the study provided reasonably reliable results.

3. Results

This meta-analysis was conducted using the statistical program SPSS version 29. The calculations were based on five studies from which a total of seven thematically relevant effects could be extracted (Table 1; Figure 1). In the analysis, the areas of social well-being and performance were defined as subgroups and the robust estimation method REML was used. The overall effect size of $d = 0.15$ ($p < 0.001$) was significant. The heterogeneity measures ($\tau^2 = 0.01$, $H^2 = 1.92$, $I^2 = 0.48$) indicated moderate heterogeneity between the studies ($z = 2.96$, $p < 0.001$, $Q = 5.47$, $df = 1$). There were significant differences between the domain of social well-being and performance subgroups. A small and non-significant effect size ($d = 0.05$) was observed in the performance domain, while a moderate and significant effect size ($d = 0.22$, $p < 0.001$) was found in the domain of social well-being (Table 1; Figure 2).

Studies short title and domain

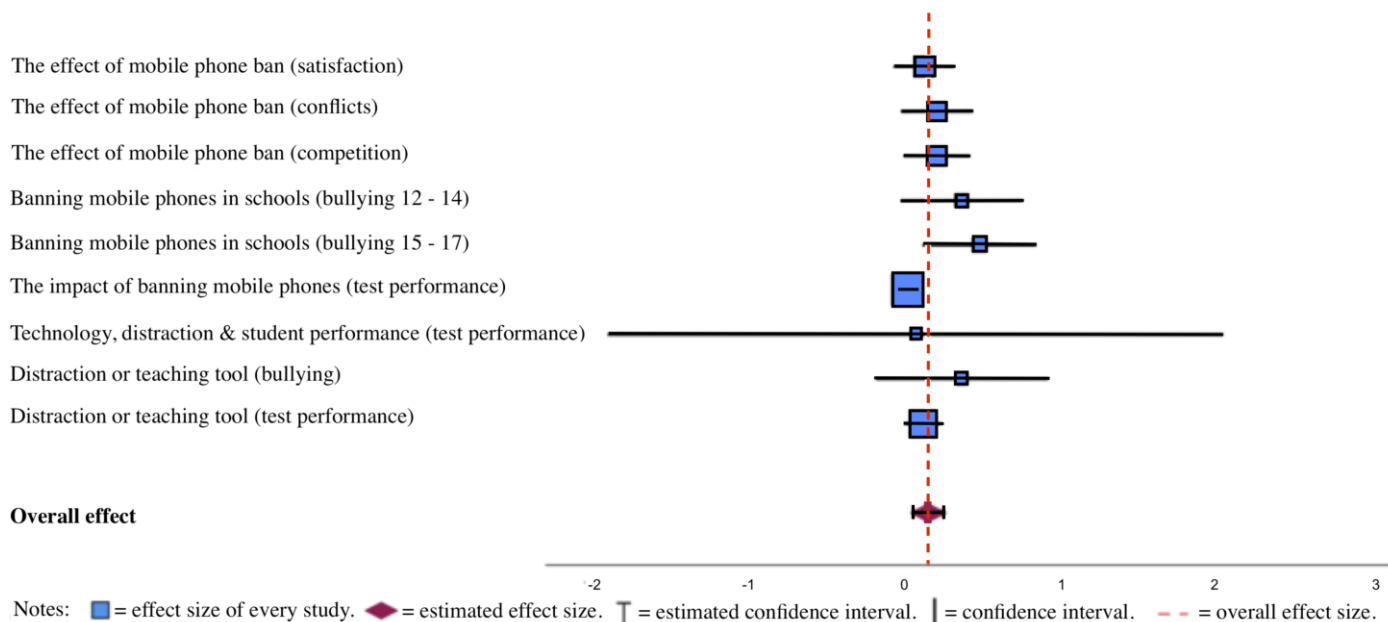


Figure 2. Overall structural model [25–29].

4. Discussion

The results of the meta-analysis showed that smartphone bans have a significant, but small, effect. The effect is more pronounced in the domain of social well-being than in the performance domain. With regard to academic performance, only a few effects relevant to this study were identified because the effect of smartphone bans is the focus of interest and has rarely been systematically investigated to date. Overall, there is no significant influence of a smartphone ban here, which contradicts numerous studies indicating that smartphone use has a negative effect on academic performance [5,31]. Consequently, hypothesis H1 must be rejected, while hypothesis H2 is supported. For methodological reasons, only quantitative research findings were considered in this study. However, numerous studies with a qualitative design have also come to the conclusion that a smartphone ban can have a positive effect on the aspects considered here. A ban on smartphones can lead to a calmer and more focused learning environment. Teachers report that students are less distracted and can concentrate better during lessons [32]. Some studies also show that smartphone bans in schools can help to reduce the incidence of bullying and cyberbullying. Students feel safer and report a positive change in the school’s social climate [33]. By banning smartphones, students communicate and socially interact directly with each other more often. This promotes the development of social skills and strengthens the community within the school [34]. The OECD also highlights the negative consequences of smartphone use on students’ attention and academic performance, and provides a finding that can explain the contradiction found. According to feedback from pupils, 29% use their smartphone at school despite a smartphone ban. In contrast, 43% of students in France report that they are nervous and anxious when they do not have their smartphone with them [4]. This shows that a smartphone ban cannot be effective if it is only limited to taking away students’ devices. This can lead to both rule-breaking and insecurity, both of which distract from learning and, therefore, have negative effects. With regard to the social sphere, the present analysis indicates a positive effect of smartphone bans. This applies, for example, to bullying among pupils. Davis and Koepke [35] provide a possible explanation for the decline in bullying as a result of a smartphone ban in schools. Due to the ban on private digital devices at schools, there is less time available for bullying on social networks, for example [35]. There are also positive effects on satisfaction, conflicts, and competition [27]. A reduction in screen time due to smartphone bans at school can, therefore, contribute

to improving the social climate. This finding aligns with the OECD's argumentation [4], which identifies risks in digital environments with regard to cyberbullying, among other things. Smartphone bans can have positive effects on social wellbeing and academic performance. For instance, studies have shown that restricting smartphone use in schools can reduce distractions and improve student focus and engagement, leading to better academic outcomes [28,32]. Additionally, smartphone bans can help to mitigate issues like cyberbullying and enhance social interactions among students [1].

However, smartphones are integral to the current and future lives of students. The negative consequences of smartphone use often stem from unreflective and thoughtless engagement with these devices, largely due to a lack of digital literacy among young people. According to the European Commission [36], promoting digital competence in education is crucial for students' personal development and future employability.

A smartphone ban in schools should primarily address the unsupervised use of the devices within the school premises, such as during breaks. This targeted approach allows for minimizing the distractions and negative behaviors associated with unsupervised smartphone use while preserving the potential benefits of these devices in educational settings.

In the classroom, smartphones should be utilized as teaching and learning tools. Educational research supports the notion that, when properly integrated into the curriculum, smartphones can enhance learning experiences by providing access to a wealth of information and facilitating innovative teaching methods [37]. By using smartphones constructively in education, schools can foster responsible usage habits, ensuring that students learn to leverage these digital devices effectively and safely as communication tools and information sources.

5. Limitations

Despite the insights gained, this study has several limitations that must be taken into account when interpreting the findings. Firstly, this study is based on only five studies, which limits the generalizability of the results. This small sample size means that the conclusions drawn from the meta-analysis may not be fully representative and should be interpreted with caution. Secondly, the included studies use different research methods and examine various aspects of smartphone bans. This methodological heterogeneity makes it challenging to directly compare the results, potentially leading to distortions in the summarized effects. Additionally, some studies, such as the study by Abrahamsson [25], lack detailed information on effect sizes. In such cases, effect sizes and standard errors had to be inferred from graphical representations, which may affect the precision of the calculated effects. Furthermore, not all studies adequately control for potential confounding variables, such as socioeconomic status, teaching quality, or existing school policies. This lack of control can reduce the validity of the results regarding the specific effects of smartphone bans. The variability in the implementation and enforcement of smartphone bans across different schools and regions also poses a challenge. This inconsistency can lead to varying results, which were not always sufficiently accounted for in the analyzed studies. Moreover, some relevant studies used qualitative research methods, whose findings could not be included in the quantitative meta-analysis. This exclusion may lead to important findings being overlooked that can only be captured through qualitative analyses. Regional differences further complicate the applicability of the results, as the studies come from various countries and regions with different cultural and educational contexts. These differences could limit the applicability of the findings to other contexts. Lastly, most of the included studies examined only the short-term effects of smartphone bans. Consequently, long-term effects on the school climate and school performance remain largely unconsidered. These limitations highlight the need for further research, especially studies with robust methodological approaches and larger sample sizes, to more comprehensively and reliably assess the effects of smartphone bans in schools. Nevertheless, despite these limitations, we consider a rapid review essential to provide an initial evidence-based foundation for educational policy, especially in times when many countries are debating smartphone bans in schools.

6. Recommendations for Action

This study aims to provide evidence-based guidance, despite the paucity of studies on the subject of smartphone bans. The results suggest that a smartphone ban can be expected to have positive effects, particularly in the social sphere. Since the social climate is crucial for successful learning and teaching [38], it can be assumed that these positive effects can be reinforced in the long term. Nevertheless, there are advantages to using smartphones in the classroom. For example, smartphones enable disabled pupils to participate better in lessons [39]. The OECD [4] points out that access to digital technology is crucial for modern education. In view of this mixed situation, it seems necessary to change the narrative that accompanies the debate about a smartphone ban. This is because it is often exclusively about the technology issue. Meanwhile, it is necessary to talk primarily about the use of technology. In the context of a smartphone ban, this means that it should not only be understood as taking away or locking away pupils' digital devices. Current research on school development indicates that the basis for such rules in schools is always a question of "collective teacher efficacy" [38]. Schools therefore must discuss and decide among the staff how to implement a corresponding smartphone ban, what strategies are necessary for this, and what goal is being pursued. This includes the need for corresponding professionalization on the part of all teachers in a school, as the OECD [4] also points out. And finally, it is necessary to work pedagogically with learners alongside the smartphone ban. As smartphones are part of pupils' everyday lives and offer much potential in terms of communication and information procurement, a smartphone ban in schools should not mean that they cannot be used as teaching aids and subjects. Rather, the media skills of pupils should be strengthened while they are protected from the negative consequences of smartphone use. To achieve this goal, emphasis should be placed on initiating and strengthening media literacy in everyday teaching, also and especially with regard to the socially acceptable use of smartphones. This requires professional teachers who have the appropriate skills and attitudes. Therefore, if a smartphone ban is to be effective across the board, it must always be combined with professionalization measures within the teaching staff and media education for learners to help them become media literate [3]. The aim of a smartphone ban at school, for example to use social networks during breaks and in the canteens, should be to turn the school into a safe space, especially for younger pupils. This measure should be accompanied by the implementation of programs to promote social interaction, social skills, and media literacy. In addition, education on the risks of smartphone use should take place and the impact of smartphone bans should be regularly evaluated. In this way, the lack of scientific evidence on this topic could also be eliminated. The aim of educational policy measures relating to smartphones in the school context should always be to minimize the negative effects of using this technology while maximizing its positive effects.

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