

# A Comprehensive Analysis of the Impact of Mobile Phones on the Secondary School Ecosystem

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## Abstract

The integration of mobile phones into the secondary school environment has become one of the most contentious issues in modern education. This paper provides a comprehensive analysis of the multifaceted impact of smartphones on students, examining both the significant benefits and the profound challenges they present. On one hand, mobile phones offer unparalleled access to information, powerful educational tools, and enhanced communication channels, potentially democratizing learning and fostering digital literacy. On the other hand, they pose serious risks, including classroom distraction, cyberbullying, mental health issues linked to excessive screen time and social media, and the exacerbation of educational inequalities. This article synthesizes current research to argue that the binary question of whether to ban or allow phones is obsolete. Instead, the focus must shift towards developing nuanced, context-aware policies that promote responsible use. Through a review of over 25 scholarly sources, this paper explores the pedagogical theories supporting device integration, the psychological mechanisms of distraction, and the socio-economic dimensions of the digital divide. It concludes that a holistic approach—combining clear school-wide policies, dedicated digital literacy curricula, proactive teacher training, and partnership with parents—is essential to harness the benefits of mobile technology while effectively mitigating its harms. The paper also discusses implementation challenges and future directions for research, providing a roadmap for fostering a safe and productive 21st-century learning environment.

## Keywords

Mobile Phones in Education, Digital Distraction, Edtech, Cyberbullying, Digital Literacy, School Policy, Adolescent Mental Health

## 1. Introduction

The rapid proliferation of mobile phones, particularly smartphones, has fundamentally transformed society, and educational institutions have not been immune to this revolution. Over the past decade, the presence of these powerful pocket-sized computers in the hands of secondary school students has escalated from a rarity to a near-universality. This phenomenon presents a complex and pressing challenge for educators, administrators, and policymakers worldwide. The central question is no longer if students have phones, but how schools should manage their presence to maximize educational benefits while minimizing their well-documented drawbacks.

The debate is often polarized. Proponents champion mobile phones as dynamic tools for learning, collaboration, and safety, aligning with constructivist pedagogies that emphasize student-centered, authentic learning experiences. Conversely, critics point to them as a primary source of distraction, social conflict, and academic underperformance, citing evidence from cognitive psychology on the limitations of divided attention. This paper posits that both perspectives are valid; the mobile phone is a quintessential double-edged sword. Its impact is not inherent to the device itself but is determined by the policies, pedagogies, and digital culture surrounding its use [1].

This article aims to move beyond the simplistic "ban versus allow" dichotomy. It will provide a balanced and in-depth examination of the benefits and drawbacks of mobile phones in schools, supported by contemporary academic research. The structure will first explore the positive potential of smartphones as educational tools, grounded in pedagogical theory. It will then delve into the significant challenges they pose to academic focus and student wellbeing, exploring the underlying psychological and social mechanisms. Subsequently, the paper will discuss the critical role of school policy and digital literacy education, introducing a conceptual framework for balanced integration [2]. A new section will address the practical challenges of implementation and future directions for technology in education. Finally, it will propose a comprehensive framework for a balanced and effective integration strategy, essential for any institution dedicated to holistic student development in the digital age.

## **2. The Benefits: Mobile Phones as Educational Catalysts**

When leveraged intentionally, mobile phones can transcend their role as communication devices to become powerful catalysts for pedagogical innovation. Their value extends beyond mere convenience, touching upon core principles of modern educational theory.

### **2.1 Access to Information and the Cultivation of Digital Literacy**

The most immediate benefit is the democratization of access to information. With an internet-connected smartphone, every student holds a vast digital library, effectively dissolving the physical boundaries of the school library. They can instantly look up definitions, explore historical events through primary sources, access scientific databases like JSTOR or Google Scholar, and watch instructional videos on complex topics from platforms like Khan Academy. This "just-in-time" learning model fosters curiosity and supports differentiated instruction, allowing students to pursue individual queries and learn at their own pace [3].

Furthermore, navigating this deluge of information is a critical 21st-century skill. By using their phones for research under teacher guidance, students move beyond being passive consumers to become critical evaluators of digital content. They learn to assess sources for credibility, identify bias, and distinguish between fact and opinion—a fundamental component of digital literacy essential for informed citizenship. This process transforms the phone from a distraction into a tool for developing intellectual discipline.

### **2.2 Enhanced Learning with Educational Technology (EdTech) and Pedagogical Alignment**

A vast ecosystem of educational applications (apps) exists to support learning across all subjects, many of which align with constructivist and collaborative learning theories. These include:

- **Interactive Learning Platforms:** Apps like Kahoot! and Quizlet make review sessions engaging and game-like, promoting active recall, participation, and formative assessment. This aligns with the pedagogical principle that active engagement enhances knowledge retention.
- **Content Creation Tools:** Students can use their phones to create podcasts, edit short films, design digital posters with Canva, and compose blogs. This allows them to demonstrate understanding in creative and multimodal ways, moving beyond traditional essays and tests to create authentic products that have value outside the classroom [4].
- **Organization and Productivity:** Calendar apps, reminder systems, and note-taking applications like Evernote or Google Keep can help students, particularly those with executive functioning challenges, to develop crucial self-management skills. Learning to use technology to organize one's learning is a meta-skill that benefits all academic pursuits.

The pedagogical strength of these tools lies in their ability to facilitate personalized, student-directed learning, a key tenet of modern education.

### **2.3 Facilitation of Communication and Collaboration**

Mobile phones streamline communication between students, teachers, and parents, creating a more connected and responsive educational community. School-wide platforms like Remind or Google Classroom can send instant notifications about assignments, schedule changes, and urgent announcements, reducing the likelihood of miscommunication. For group projects, students can use messaging apps, shared documents, and cloud storage to collaborate seamlessly both inside and outside the classroom. This not only prepares them for the collaborative nature of the modern workplace but also fosters a sense of shared purpose and collective responsibility.

### **2.4 Safety and Emergency Preparedness**

From a safety perspective, mobile phones provide a direct line of communication for students to contact parents or emergency services. In situations ranging from a missed bus to a more serious campus-wide emergency, the ability for students to communicate instantly can alleviate anxiety and facilitate a coordinated response. This sense of security is a significant factor for many parents who support their children carrying phones. Furthermore, in the context of heightened concerns about school safety, the ability to receive real-time alerts and communicate with authorities is a powerful argument for the presence of these devices [5].

### **2.5 Supporting Students with Special Educational Needs and Disabilities (SEND)**

The potential of mobile phones to support personalized learning is particularly salient for students with Special Educational Needs and Disabilities (SEND). These devices can be equipped with a suite of accessibility features and specialized applications that act as powerful assistive technologies, helping to level the playing field and foster greater inclusion in the mainstream classroom. For students with visual impairments, built-in screen readers (e.g., VoiceOver on iOS, TalkBack on Android), magnification gestures, and high-contrast display settings can make digital content accessible. Students with hearing impairments can benefit from speech-to-text applications that provide real-time captioning for teacher instructions or classroom discussions. Furthermore, students with dyslexia or other reading difficulties can use text-to-speech functions and immersive reader tools within apps like Microsoft Word to decode complex texts, thereby reducing cognitive load and allowing them to focus on comprehension. For students with autism

spectrum disorder (ASD), mobile phones can serve as organizational anchors and social supports. Visual scheduling apps can help them navigate the school day's transitions and expectations, reducing anxiety. Similarly, social story apps can provide models for navigating complex social interactions. By empowering SEND students with tools that cater to their specific learning needs, mobile phones can promote autonomy, boost confidence, and facilitate a more equitable and supportive learning environment for all.

**Table 1.** Summary of key benefits and associated tools.

Benefit Category	Description	Example Tools & Applications
Information Access & Digital Literacy	Instant research, fact-checking, critical evaluation of sources.	Google Scholar, Khan Academy, YouTube Edu, news websites
EdTech Integration & Pedagogy	Interactive learning, content creation, skill practice, personalized learning.	Kahoot!, Quizlet, Duolingo, iMovie, Canva, Padlet
Communication & Collaboration	Teacher-student-parent updates, group project coordination, community building.	Remind, Google Classroom, WhatsApp, Slack, Microsoft Teams
Organization & Self-Management	Time management, task tracking, digital portfolio, executive function support.	Google Calendar, Todoist, Evernote, Trello
Safety & Wellbeing	Direct line for emergencies, coordination with parents, real-time alerts.	Native calling/texting, school safety apps, emergency alert systems

Table 1 mentions how digital tools can comprehensively enhance the educational experience-from knowledge acquisition and teaching innovation to communication, collaboration, and mental health support-making education more efficient, personalized, and safe.

### 3. The Drawbacks: Mobile Phones as Sources of Disruption and Harm

Despite their potential, the negative impacts of mobile phones in schools are substantial and well-documented, often outweighing the benefits in the absence of clear guidelines. These drawbacks are rooted in cognitive, social, and psychological domains.

#### 3.1 Academic Distraction and the Cognitive Cost of Multitasking

The most cited drawback is distraction. The constant allure of notifications from social media, games, and messaging apps creates a powerful draw away from academic tasks. This phenomenon, often termed "continuous partial attention," fragments cognitive focus and undermines deep learning [6]. Research in cognitive psychology consistently shows that multitasking is a myth; the brain is actually "task-switching," which incurs a cognitive cost and leads to more errors and reduced retention.

A seminal study by Beland and Murphy (2016) found that banning mobile phones in schools led to a significant increase in student performance on standardized tests, with the effect being twice as large for low-achieving students, suggesting they are most vulnerable to distraction. Crucially, the phone is not merely a distraction for the user; its mere presence, even face-down on a desk, can reduce available cognitive capacity as the brain expends effort to *not* pay attention to it, a state Ward et al. (2017) call "brain drain."

#### 3.2 Cyberbullying and the Erosion of School Community

The school day no longer ends at the campus gate. Mobile phones enable cyberbullying-a pervasive and insidious form of harassment that can follow a student home. The anonymity, permanence, and public nature of online posts can amplify the victim's trauma, leading to severe emotional distress, school avoidance, and in tragic cases, self-harm. Unlike traditional bullying, there is no safe haven [7]. Furthermore, phones can exacerbate social anxiety and cliquish behavior, with exclusion happening through private group chats and social media posts visible to all. This can fracture the school community, eroding the trust and sense of belonging that are foundational to a positive learning environment.

#### 3.3 Mental Health and Wellbeing: The Anxiety Link

A growing body of evidence links heavy smartphone and social media use with increased rates of adolescent anxiety, depression, and poor sleep quality. The constant social comparison on platforms like Instagram and TikTok, where peers present curated, idealized versions of their lives, can severely damage self-esteem. The fear of missing out (FOMO) is intensified by seeing peers socialize online, creating a sense of isolation and social anxiety. Within the school, this can manifest as increased irritability, difficulty concentrating on academic work, and a general sense of discontent, all of which are detrimental to a positive learning environment. The blue light emitted from screens also disrupts circadian rhythms, leading to sleep deprivation which further impairs cognitive function and emotional regulation [8].

#### 3.4 Academic Dishonesty in the Digital Age

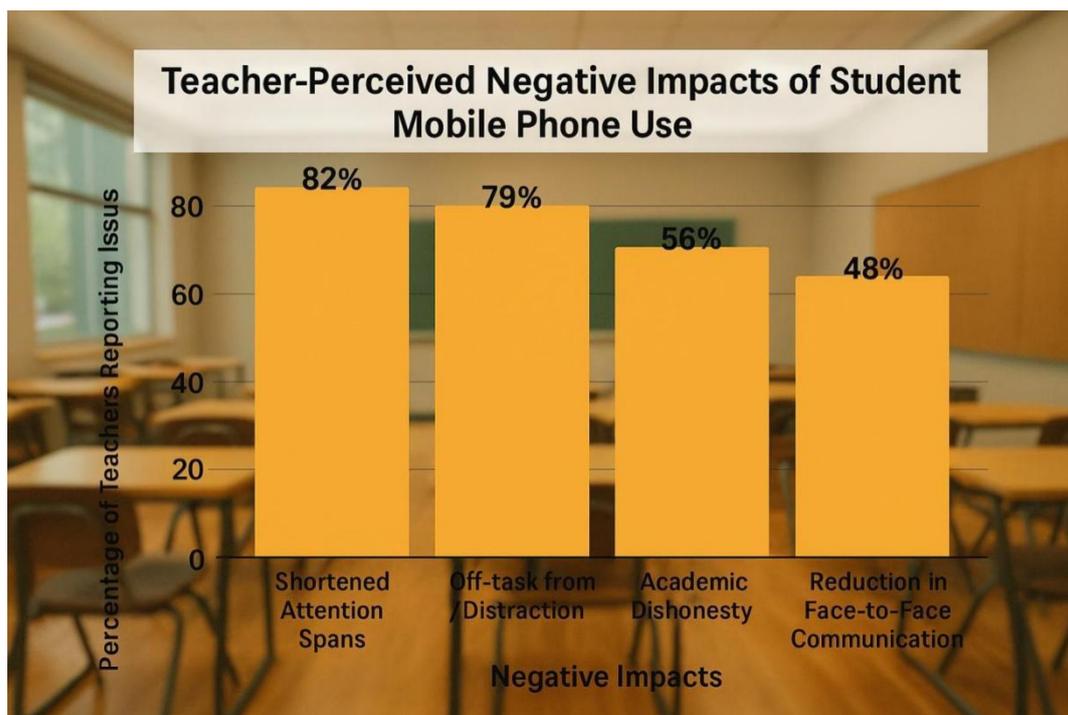
Mobile phones provide new and facile avenues for cheating, challenging traditional assessment methods. Students can quickly search for answers during tests, photograph and share exam questions with a single click, or use encrypted messaging apps to collaborate dishonestly in real-time. This undermines academic integrity, devalues honest work, and creates an atmosphere of mistrust between students and faculty. It forces educators to become digital police, shifting the classroom dynamic from one of collaboration to one of surveillance.

### 3.5 The Digital Divide: From Access to Quality and Use

While phones can be great equalizers in terms of information access, they can also highlight and exacerbate existing inequalities. Not all students have the latest, most powerful devices with unlimited data plans. A BYOD (Bring Your Own Device) policy can therefore create a visible socioeconomic hierarchy and disadvantage students whose devices are older, slower, or have limited functionality. This moves the problem from *access* to *quality* of access. Furthermore, research suggests a "usage gap," where students from lower-income backgrounds may use their devices more for entertainment, while their more affluent peers use them for information-seeking and skill development, potentially widening the achievement gap [9].

### 3.6 The Physical Health Implications: Ergonomics and Sedentary Behavior

Beyond the cognitive and psychological impacts, the pervasive use of mobile phones raises significant concerns regarding students' physical health, an aspect often overlooked in the debate. Two primary areas of concern are ergonomics and the reinforcement of sedentary behavior. The typical posture for using a mobile phone—head bent forward, shoulders slumped, and arms held static—places considerable strain on the cervical spine. This "text neck" posture can lead to chronic pain in the neck, shoulders, and upper back. Given that adolescents are in a critical period of physical development, prolonged adoption of such poor postures could have long-term musculoskeletal consequences. Additionally, the small screen size and fine motor skills required for typing and navigating can contribute to eye strain (digital eye strain or computer vision syndrome) and repetitive strain injuries in the thumbs and wrists. Compounding these ergonomic issues is the fact that phone use is inherently sedentary. Time spent engaged with a mobile device is typically time not spent in physical activity. Within the school context, this extends beyond classroom hours to breaks and lunchtimes, where students might previously have been socializing actively or playing outdoors. Instead, they are often found clustered together, yet isolated, scrolling through their devices. This reduction in low-intensity physical activity and spontaneous play throughout the school day contributes to a more sedentary lifestyle, which is linked to broader public health issues such as obesity and decreased cardiovascular fitness. Therefore, the physical cost of mobile phone integration must be considered a tangible drawback, necessitating education on ergonomic practices and the promotion of regular screen breaks and physical movement.



**Figure 1.** Teacher-Perceived negative impacts of student mobile phone use in classrooms.

Figure 1 shows excessive mobile phone use weakens students' concentration and social skills. Teachers are generally concerned about declining classroom efficiency and students' behavior deviating from learning objectives. School administrations can use this to develop clearer "Classroom Digital Device Use Policies", such as setting specific learning purposes or guiding students to use technology correctly through digital literacy courses.

## 4. The Path Forward: Policy, Literacy, and Balanced Integration

Given this complex landscape of benefits and risks, a laissez-faire approach is untenable. A proactive, multi-pronged strategy is required, one that is systemic and involves all stakeholders.

#### 4.1 Developing Effective and Nuanced School Policies

School policies must be clear, consistent, collaboratively developed, and communicated effectively to all stakeholders: students, parents, and staff [10]. They exist on a spectrum, and the choice depends on the school's specific context, resources, and educational philosophy:

- **Outright Bans:** Prohibiting phones entirely on school grounds. This approach eliminates in-class distraction and reduces cyberbullying during school hours but forfeits all potential educational benefits and may be difficult to enforce, especially with older students.
- **"Away for the Day":** Phones are permitted on campus but must be powered off and stored in lockers or locked pouches (e.g., Yondr) for the duration of the school day. This is a popular compromise that balances safety concerns with the need for an undistracted learning environment.
- **Regulated Use:** Allowing phones for specific, teacher-directed educational purposes but requiring them to be stowed away otherwise. This model requires high levels of teacher consistency, professional development, and student compliance to be effective.
- **BYOD Integration:** Actively incorporating phones into the curriculum. This model maximizes educational potential but requires robust school wifi, a strong digital citizenship program, and strategies to address the digital divide.

The most effective policy is likely a hybrid model, such as "Away for the Day" with scheduled, supervised periods for pedagogical use in specific lessons. The key is that the policy is not static; it should be regularly reviewed and adapted based on feedback and evolving technological landscapes.

#### 4.2 The Imperative of Digital Literacy and Citizenship Education

Policy alone is insufficient and often leads to a "cat-and-mouse" dynamic where students find ways to circumvent rules. To foster intrinsic motivation for responsible use, schools must integrate comprehensive digital literacy and citizenship into the curriculum across all subjects, not just in a single seminar. Students need to be explicitly taught:

- **Digital Wellness:** How to manage screen time, recognize the signs of tech addiction, understand the impact of social media on mental health, and cultivate a healthy digital/analog balance.
- **Ethical Behavior:** The real-world consequences of cyberbullying, the permanence and impact of digital footprints on future opportunities, and the principles of academic honesty in a digital context.
- **Critical Thinking:** How to identify misinformation, deepfakes, and biased sources online, becoming savvy consumers and creators of digital content.

This education empowers students to make responsible choices independently, a skill far more valuable and transferable than simple compliance with a school rule.

#### 4.3 The Role of Teachers and Parents as Partners

Teachers require ongoing, meaningful professional development to confidently and effectively manage technology in their classrooms. This goes beyond simple tool training; it includes pedagogical training on integrating devices to enhance learning outcomes and classroom management strategies for minimizing off-task use without creating a punitive atmosphere [11].

Simultaneously, parents must be essential partners in this effort. Schools should educate parents on the same digital citizenship principles and encourage the establishment of healthy phone-use habits at home, such as device-free dinners and charging phones outside the bedroom at night. Consistent messaging between home and school is critical for reinforcing positive behaviors and creating a unified front in supporting adolescent digital wellbeing.

#### 4.4 Fostering Student-Led Digital Citizenship Initiatives

While top-down policy and teacher-led instruction are crucial, a powerful yet underutilized strategy is the active involvement of students themselves in shaping the digital culture of their school. Empowering students to lead digital citizenship initiatives can foster a greater sense of ownership, responsibility, and peer-to-peer influence that is often more effective than adult admonitions. Schools can facilitate the establishment of a student "Digital Wellness Council" or "Tech Ambassador" program. This council, comprising student representatives from various grades, would work in partnership with faculty advisors to address the real-world digital challenges they face. Their initiatives could include: creating peer-led workshops on topics like combating cyberbullying, managing digital footprints, or identifying misinformation; designing and promoting school-wide campaigns for "Screen-Free Lunch Breaks" or "Digital Detox Weeks"; and providing feedback to school administrators on the practical realities of the existing mobile phone policy. By giving students a genuine voice and agency, the school acknowledges their role as key stakeholders. This approach leverages the potent influence of social norms within the adolescent community, making responsible digital behavior not just a rule to follow, but a social value to uphold. Student-led initiatives can bridge the gap between abstract policy and lived experience, creating a more dynamic, responsive, and positively oriented digital ecosystem where students feel equipped and motivated to be proactive digital citizens rather than passive rule-followers.



**Figure 2.** A conceptual model for balanced mobile phone integration.

Figure 2 depicts a comprehensive educational framework that emphasizes balancing students' freedom and discipline in using mobile phones at school through policy, education, teacher training, and family collaboration, ultimately creating a safe, focused, and effective learning environment.

## 5. Implementation Challenges and Future Directions

Successfully implementing a holistic framework is fraught with challenges. Recognizing these is the first step towards overcoming them.

### 5.1 Practical Implementation Hurdles

- **Resource Inequality:** Schools in underfunded districts may lack the resources for teacher training, robust WiFi, or alternative technology, making a BYOD model deeply inequitable and a ban more appealing by default.
- **Staff Buy-in and Capacity:** Teachers are already overburdened. Mandating a new digital citizenship curriculum or new classroom management techniques without providing time, training, and support can lead to resistance and inconsistent application.
- **Enforcement Fatigue:** Consistently enforcing phone policies can be exhausting for teachers and administrators, leading to policy drift where rules are gradually ignored.
- **The Pace of Technological Change:** New apps and features emerge constantly, often faster than policies can be updated. This requires policies to be principles-based (e.g., "no non-educational use during class time") rather than app-specific.

### 5.2 The Evolving Landscape: AI and Immersive Technologies

The future will introduce new complexities. The rise of generative Artificial Intelligence (AI) on mobile platforms presents a new frontier for both learning and academic dishonesty. Students can use AI to generate essays, solve math problems, and write code, challenging educators to redesign assessments for authenticity. Furthermore, the impending adoption of augmented reality (AR) and virtual reality (VR) through mobile devices could transform experiential learning but also raise new concerns about privacy, cost, and digital immersion. Future research must focus on the pedagogical implications of these technologies and develop frameworks for their ethical integration.

### 5.3 The Challenge of Assessing Digital Literacy and Citizenship

A significant, yet often unaddressed, challenge in implementing a holistic framework is the difficulty of effectively assessing the outcomes of digital literacy and citizenship education. Unlike traditional subjects where knowledge can be tested via exams, digital citizenship encompasses skills, attitudes, and behaviors that are complex and contextual. How does a school measure a student's growth in critical thinking, empathy online, or ability to self-regulate screen time?

The lack of robust, standardized, and practical assessment tools can relegate digital literacy to a "soft" skill that is talked about but not systematically tracked or valued in the same way as math or literacy. Without meaningful assessment, it is challenging to evaluate the effectiveness of the school's program, justify the allocation of resources, or provide students with feedback on their development in these crucial areas. Moving forward, educators and researchers need to collaborate on developing authentic assessment models. These could include portfolio-based assessments where students curate evidence of their responsible online interactions and critical analyses of digital media; scenario-based reflections where students respond to and analyze complex digital dilemmas; and self-assessment surveys that track changes in students' perceptions and habits over time. Integrating these assessments into the school's reporting structure would signal the fundamental importance of these competencies and ensure that digital citizenship education is a accountable and integral part of the school's mission, rather than an optional add-on.

## 6. Conclusion

The integration of mobile phones into the school ecosystem is an undeniable and persistent reality of 21st-century education. This in-depth analysis confirms that the device is neither a panacea for educational ills nor a singular force of destruction. It is a powerful, malleable tool whose impact is dictated by the context of its use. The benefits-ranging from enhanced constructivist learning and communication to improved safety-are significant and should not be dismissed. However, the parallel risks-including pervasive cognitive distraction, mental health challenges, and the erosion of school community through cyberbullying-are too severe to ignore.

Therefore, the mission for schools is not to eliminate the technology but to master its management through deliberate, thoughtful strategy. The path forward requires abandoning simplistic, one-size-fits-all solutions. Instead, it demands the implementation of a holistic framework that combines a thoughtful, context-appropriate school policy with a deep and ongoing commitment to teaching digital literacy and citizenship. By empowering students with the wisdom to use their devices responsibly, training teachers to harness their pedagogical potential, and partnering with parents to create a consistent culture of digital wellness, schools can navigate the current challenges and those on the horizon. The goal is to transform the double-edged sword into a precision tool, forging a more engaging, safe, equitable, and effective learning environment that truly prepares students for the complexities of the modern world.

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