



Critical Evaluation of Chromebook Procurement in the Digitalization of Education Program Balancing Innovation and Policy Challenges

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ABSTRACT

This paper critically evaluates Chromebook procurement in Indonesia's education digitalization program by examining how procurement governance shapes corruption risks and shapes the conditions under which educational technology is implemented. Employing a qualitative case study approach, this research draws on secondary data from procurement documents, regulatory frameworks, media reports, and relevant academic literature, which were analyzed through content analysis and validated using source triangulation. The findings indicate that the most significant corruption risks emerged during the planning and technical specification stages, particularly through budget mark-ups, specification locking, restricted vendor competition, and informal negotiations among bureaucratic actors, suppliers, and external parties. Because this study does not collect perception data from teachers or students, the Technology Acceptance Model is used only as a conceptual lens for interpreting documented implementation conditions, such as internet dependence, uneven teacher readiness, and unequal access to digital resources, which may affect perceived usefulness and perceived ease of use. The study concludes that the digitalization of education should not be measured solely by the number of devices distributed, but by the transparency, accountability, and contextual relevance of procurement decisions. Strengthening oversight mechanisms, institutional integrity, and need-based planning is essential to ensure that digital technologies contribute to substantive educational improvement rather than serving merely as instruments of policy symbolism.

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■ INTRODUCTION

Education systems are investing heavily in digital tools as part of 21st-century reform. Recent OECD analysis notes that COVID-19 dramatically accelerated the adoption of online learning platforms and classroom devices, though this often replicates traditional instruction rather than transforming it. At the same time, major digitalization programs have been launched in many countries. Indonesia's "Merdeka Belajar" initiative set ambitious goals for connecting all schools to the Internet and equipping students with laptops (Pratiwi, 2025). A flagship element has been a one-to-one (1:1) device program that provides each

student with an individual computing device, typically a Chromebook. A Chromebook is a laptop running Google's Chrome OS, optimized for cloud/web use and designed to access Internet resources at a lower cost than PCs (Miller, 2015). Chromebooks gained the majority market share in K-12, as evidenced by reports that by 2017, over half of U.S. teachers had 1:1 programs with Chromebooks dominating (Humphrey, 2023). In Indonesia, officials planned to purchase millions of Chromebooks; by 2023, over 1 million Chromebooks had been ordered for public schools at a cost of roughly IDR 10-12 trillion (USD 600-700M). These devices were seen as

a key input to education digitalization (the broad shift of teaching/learning processes onto digital platforms, though no single formal definition exists) and to bridging resource gaps in remote areas.

Several studies report modest gains in academic performance and engagement from One-student-one-device (1:1) programs. A large quasi-experimental study in Massachusetts found students in a laptop (1:1) program scored significantly higher on standardized tests and grades after one year (Brown, 2018). Indonesian classroom reports similarly note improved participation when Chromebooks are integrated. Chromebooks for interactive lessons increased 5th graders' engagement and collaboration, raising motivation and digital literacy. Student activity jumps from 38% to 90% when math lessons use Chromebooks with educational games (Hasanah et al., 2022). Tailored software and internet access should enable personalized learning, aligning with the OECD's view that technology can democratize autonomous learning experiences (Hardianti et al., 2024; Istance & Kools, 2013). Chromebooks also offer procurement efficiency; an IDC report (commissioned by Google) concluded they require 69% less IT labor for deployment and 92% less for support than PCs. Their per-device three-year cost is USD 590 lower than that of typical laptops, and recent price cuts (from USD 13.30/month to USD 20.75/month) could save USD 935 per unit over three years.

Many analyses temper these successes. Reviews find that learning gains are often small or non-existent. A systematic review found that a 1:1 program produces mixed results, including positive, negative, and no effects on achievement, depending on context (Islam & Grönlund, 2016). Others study only slight improvements in certain subjects and stress that outcomes vary by implementation. Harper & Milman (2016) literature synthesis identified common themes (achievement, classroom environment, motivation, integration challenges) but noted that many studies report neutral test-score changes.

The value added by digital devices appears to depend strongly on pedagogical conditions. Schools that adopt innovative, student-centered instruction tend to derive greater benefits from one-to-one device programs, whereas technology use in rote instructional practices often yields limited effects. Existing evidence on 1:1 initiatives remains largely concentrated in the United States and Europe. At the same time, Indonesian studies are still dominated by small-scale classroom action research and survey-

based accounts that report positive tendencies without examining the broader governance conditions of national technology procurement (Balanskat, 2013). This leaves an important gap in understanding how procurement governance, corruption risk, technical specification decisions, and infrastructure readiness shape the educational value and acceptance of Chromebooks in Indonesia's digitalization program. This study addresses that gap by analyzing the Chromebook case as a governance problem with direct implications for technology adoption, public accountability, and educational equity.

Implementation challenges help explain these mixed results. Infrastructure remains uneven. As the OECD emphasizes, access to stable, high-speed Internet is key to digital learning, and without it, a digital transformation cannot occur (Pilipchuk et al., 2020). Many Indonesian schools in remote regions lack reliable broadband and even electricity, creating a digital divide that may blunt benefits. Prosecutors noted exactly this problem (Priyadharma, 2021). Many Chromebooks have proven ineffective in areas with no internet access. This illustrates a policy practice mismatch. Devices were purchased centrally, but on-the-ground conditions rendered them unusable. Another challenge is teacher capacity. Even in OECD countries, roughly one in five secondary teachers report needing more ICT training (Ananiadou & Rizza, 2010). If teachers lack the skills or confidence, devices sit idle or are used only for drill exercises. Indonesian pilot programs found that substantial training and support were needed before teachers could incorporate Chromebooks into lessons (unspecified qualitative reports) (Wang et al., 2023). Inadequate teacher preparation is a known barrier in the literature.

Governance and equity issues also loom large. Procurement processes ideally ensure transparency, competition, and value for money, but both global and Indonesian examples reveal pitfalls (Karolina et al., 2021). The Indonesian Chromebook case is often cited as a procurement failure or a corruption scandal (Salim et al., 2025). The Attorney General's Office publicly accused the ministry of conspiring to push through a flawed Chromebook deal, warning of significant waste of state funds and of forced procurement despite technical shortcomings. Analysts have critiqued other 1:1 rollouts for overlooking context or lacking accountability (Salim et al., 2025). For instance, a study of Peru's 1:1 tablet program noted management failures and later budget cuts. Critics argue that millions spent on gadgets without systemic planning can divert

resources from proven interventions (Perez, 2021).

The procurement of Chromebooks and Chrome Device Management (CDM) by Indonesia's Ministry of Education, Culture, Research, and Technology (Kemendikbudristek) has come under public scrutiny due to alleged large-scale corruption practices. To avoid chronological ambiguity, this study distinguishes between the procurement implementation period and the later legal process. Official materials from the Attorney General's Office frame the alleged case as involving the procurement of Chromebooks and CDM during 2019-2022, while the investigation and legal proceedings intensified in 2025 (Kejaksaan Agung Republik Indonesia, 2025c). The project was initially intended to support the digitalization of national education. However, later allegations concerned the manipulation of technical specifications, restricted competition, and the shift toward ChromeOS-based devices (Kejaksaan Agung Republik Indonesia, 2025b).

The allegations surrounding the Chromebook procurement case suggest that the issue cannot be understood solely as administrative non-compliance or individual misconduct. The case also highlights how procurement decisions may be shaped by interactions among public officials, vendors, technical actors, and project authorities. For this reason, this study employs Negotiated Order Theory to examine how informal arrangements may operate within formal procurement procedures and influence the governance of education digitalization policy. Negotiated Order Theory enables the examination of corruption as a collective and relational process rather than merely as an individual act of legal violation (Clarke, 2021). Corruption in this case can be interpreted as the result of social negotiations among actors within the bureaucracy, vendors, and project authorities. This theory emphasizes that organizational order is not fixed but rather is continuously constructed through ongoing social interactions and negotiations among the actors involved.

Beyond the organizational perspective, corruption in public procurement has also been examined through the Fraud Triangle, which explains fraudulent behavior as the interaction of pressure, opportunity, and rationalization (Kagias et al., 2022). Within procurement systems, pressure may arise from organizational demands, budget realization targets, or policy implementation deadlines. Opportunity is associated with weaknesses in procurement governance, internal control, and

supervisory mechanisms that allow irregular practices. In contrast, rationalization enables procurement actors to justify deviations from established procedures as acceptable within organizational routines. While the Fraud Triangle provides an analytical framework for explaining the conditions that facilitate fraudulent behavior, it pays less attention to the social interactions through which procurement decisions are negotiated among institutional actors. The combination of the Fraud Triangle and Negotiated Order Theory therefore provides complementary perspectives for examining procurement corruption by considering both the organizational conditions that enable irregularities and the informal negotiation processes through which they are sustained.

This phenomenon is reflected in a statement by the Attorney General's Office indicating that technical meetings held between May and June 2020 resulted in a decision to shift to Chromebook usage, despite an earlier study conducted in April 2020 which concluded that such devices were unsuitable due to limited internet infrastructure in many regions (Handayani & Hartanto, 2025). Technical recommendations from the Deputy Attorney General for Civil and Administrative Affairs (Jamdatun), which suggested using the Windows operating system, were also disregarded. This strengthens the assumption that informal negotiation processes took place outside formal procedural structures.

Indonesia Corruption Watch (ICW) and the Committee for Legislative Monitoring have also highlighted various irregularities, including the use of Special Allocation Funds for IT procurement, the absence of this project in the General Procurement Plan System (SiRUP), and the imposition of Chromebook technical specifications despite trial results in 2019 indicating their ineffectiveness (ICW, 2023). This suggests a consensus or tacit agreement among the parties involved to proceed with the project, which, in the terminology of Negotiated Order Theory, can be understood as an informal social order embedded in everyday practices.

The Attorney General's Office further revealed that at least five major vendors were involved in the procurement process, including PT Zyrexindo Mandiri Buana, PT Evercross Technology Indonesia, and PT Bangga Teknologi Indonesia (Advan), all of which are suspected to have benefited from a closed and non-transparent procurement structure (Handayani & Hartanto, 2025). This informal negotiation mechanism illustrates how the interests of certain groups were accommodated

through restricted e-catalog arrangements that allowed only selected companies to meet the tailored technical specifications.

International studies indicate that procurement corruption frequently develops through interactions among multiple institutional actors rather than through isolated individual decisions. These findings are consistent with the patterns observed in the Chromebook procurement case, where procurement governance involved interactions among policymakers, technical officials, and vendors during the formulation of technical specifications and procurement decisions. This context provides the empirical basis for examining the procurement process through the analytical perspectives adopted in this study.

In the Chromebook case, informal negotiations created a shared perception that the procurement represented educational modernization, whereas substantively it did not align with actual field needs. The imposition of technical specifications, the neglect of prior studies, and disproportionate mass procurement indicate that corruption is not merely a violation of rules, but a socially constructed practice institutionalized and maintained by actors within the system.

Beyond governance perspectives, the adoption of educational technology is often explained by the Technology Acceptance Model (TAM), which posits that perceived usefulness and perceived ease of use influence users' intentions to adopt technology. In its conventional application, TAM requires empirical data on users' perceptions, usually obtained from surveys, interviews, or behavioral observation. Since the present study relies exclusively on secondary documentary sources, TAM is not applied as a direct measurement model. Instead, it is used as a conceptual and interpretive lens to examine documented conditions, such as infrastructure readiness, device functionality, teacher support, and institutional trust, that may potentially influence future user acceptance of Chromebooks. Within this clarified framework, Negotiated Order Theory and the Fraud Triangle explain the governance and corruption-risk dimensions of procurement. At the same time, TAM helps interpret the potential implications of those governance conditions for technology adoption without directly measuring teachers' or students' perceptions.

This study examines how weaknesses in planning, technical specification formulation, and vendor selection shaped the governance of Chromebook procurement within Indonesia's education digitalization program. It further

considers how these procurement practices produced documented implementation conditions that, according to the TAM framework, may affect the perceived usefulness and usability of Chromebooks in teaching and learning, particularly with respect to infrastructure readiness, teacher capacity, and unequal access to digital resources. The analysis does not infer actual user perceptions from teachers or students; rather, it evaluates the conditions that could shape those perceptions if the technology is implemented in schools. The analysis also explores how corruption risks in public procurement may affect the educational value of digitalization policy. Through this focus, the study places Chromebook procurement within broader discussions on public accountability, institutional integrity, technology adoption, and educational equity, rather than viewing it solely as a technical process of device distribution.

■ LITERATURE REVIEW

Systemic Corruption in Public Procurement and Governance Failures

Recent studies confirm that corruption in IT public procurement in Indonesia is systemic and driven by informal negotiations between bureaucratic actors and vendors. These studies highlight governance weaknesses, the normalization of fraudulent practices, and the need for structural transformation to eradicate procurement corruption.

Hafiz and Hamidah (2026) employed a normative juridical approach to examine the determination of suspects in the Chromebook procurement case, concluding that the designation was procedurally valid. They also revealed that the policy of locking technical specifications, which limited procurement to a single operating system, indicated an abuse of administrative discretion intended to benefit specific corporations, resulting in proven state financial losses. Jamil and Bangun (2025), using a normative juridical approach that combines statutory and case analysis, highlighted deficiencies in transparency and integrity within digital procurement governance, the suboptimal role of the Corruption Eradication Commission KPK in oversight, and the urgent need to strengthen anti-corruption legislation to prevent budget markups, specification manipulation, and conflicts of interest.

Hamid & Sukanta (2025) conducted a qualitative conceptual analysis of the Chromebook gate case, drawing on secondary data, including audit reports, government documents, and media sources. By applying the Broken Windows Theory and the Technology

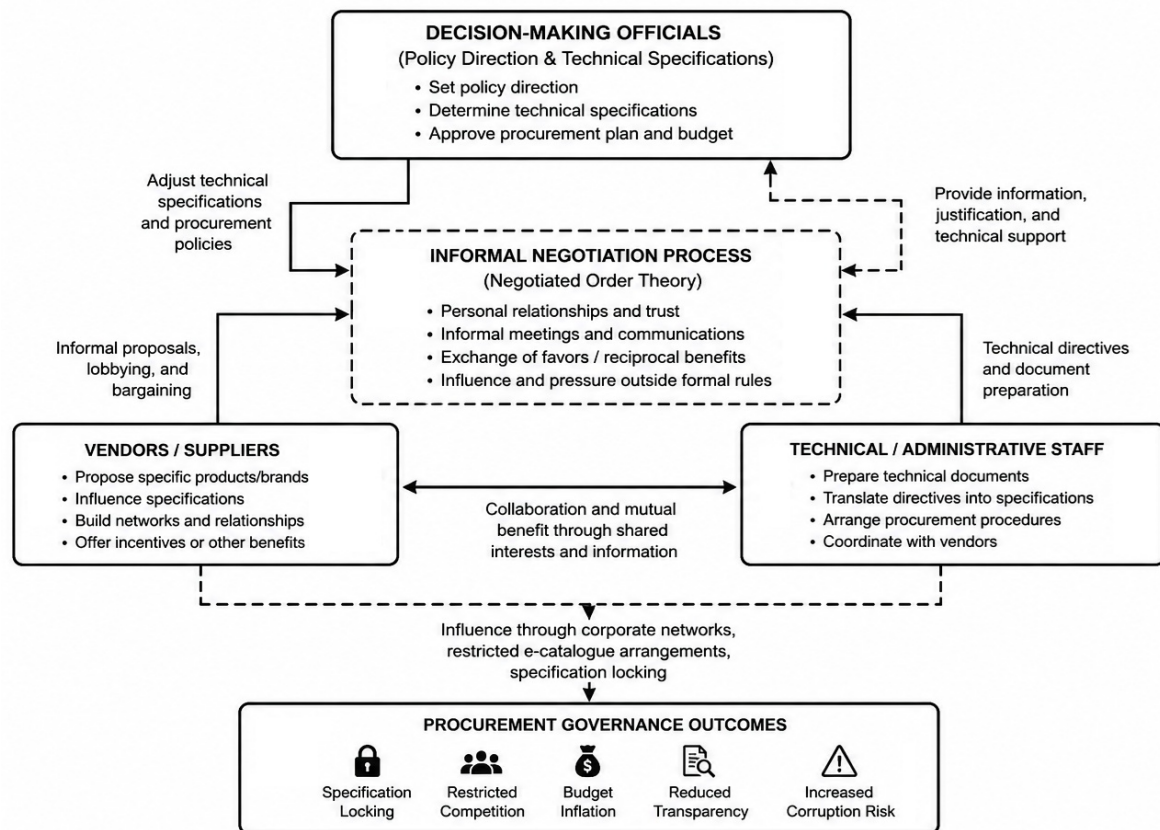


Figure 1. Concept map of informal negotiation mechanisms in chromebook procurement based on negotiated order theory

Acceptance Model, they identified three dominant corrupt practices, namely price markups, specification manipulation, and conflicts of interest, that have become normalized within procurement processes, thereby eroding public trust and hindering the adoption of educational technology.

Refansa & Azhar (2025) approached the issue through the lens of Negotiated Order Theory, employing qualitative methods including document and discourse analysis. Their findings conceptualize corruption in Chromebook procurement as a product of informal social negotiations, where unwritten rules such as price markups, direct appointments, and concealed technical specifications are continuously negotiated among bureaucrats and vendors to serve group interests, ultimately institutionalizing corruption as a form of social order within the system.

These studies consistently indicate that corruption in public information technology procurement is a collective, systemic phenomenon shaped by informal agreements rather than by isolated individual misconduct. They differ, however, in both theoretical orientation and methodological design.

Juridical studies primarily examine legal procedures and regulatory compliance, whereas conceptual and organizational perspectives emphasize power relations, informal negotiations, and institutional dynamics. Normative legal analyses provide a strong foundation for interpreting procurement regulations but offer limited empirical evidence regarding how informal negotiations emerge within procurement processes. Qualitative studies provide richer explanations of interactions among actors, although many rely on a limited range of evidence, which makes cross-validation difficult. A remaining gap lies in the limited use of systematically triangulated evidence that combines procurement documents, regulatory frameworks, investigative media reports, and academic literature to explain corruption mechanisms across multiple sources. The present study applies a qualitative case study design with source triangulation, systematically comparing procurement documents, government regulations, investigative media reports, and scholarly literature through content analysis. This analytical strategy enables cross-validation of evidence from different sources, strengthens the credibility of the findings, and

provides a more comprehensive explanation of how informal negotiation mechanisms, governance weaknesses, and anti-corruption policies interact throughout the Chromebook procurement process. The resulting analysis extends previous studies by integrating legal, organizational, and governance perspectives into a single triangulated framework to examine corruption risks in public procurement.

Impact of Chromebook Integration on Learning Outcomes and Digital Competencies

The use of Chromebooks has been shown to improve students' critical reasoning skills. Noriyana et al. (2024) employed a quantitative pre-experimental design with a one-group pretest-posttest approach. They reported a statistically significant increase in students' critical reasoning abilities following the implementation of Chromebook-based instruction in science learning. Their findings indicate that technology-supported learning environments can facilitate students' capacity to analyze information, formulate conclusions, and evaluate evidence more systematically. This result supports the broader argument that digital tools, when integrated into structured pedagogical practices, can promote the development of higher-order thinking skills.

In a related vein, Kamba et al. (2024) investigated the role of Chromebooks in supporting literacy development by integrating the *Let's Read* application. Using a qualitative case study approach, the study found that students demonstrated higher motivation, improved concentration, and greater participation in reading activities. The use of interactive digital narratives and visual content was found to create a more engaging learning environment, thereby enhancing students' reading engagement and literacy outcomes. The study also identified several implementation challenges, including technical constraints and the need for curriculum alignment, suggesting that effective integration of technology requires adequate preparation and institutional support.

The impact of Chromebook use extends beyond learning, including student engagement and academic achievement. Mudasir and Noor (2025) reported that integrating Chromebooks in a rural junior high school context led to notable improvements in students' cognitive, emotional, and behavioral engagement. In addition, the study documented an approximately 10% increase in students' academic performance in mathematics and science. The findings further indicate improvements in students' digital literacy,

particularly in terms of accessing information and participating in online collaboration. This paper also highlights persistent barriers, including limited internet connectivity, unequal access to technological resources, and insufficient teacher training, underscoring the importance of infrastructural readiness and professional development for technology integration.

Further insights into the development of digital competence are provided by Trianus et al. (2026), who examined the relationships among Chromebook use, digital literacy, and student creativity. The study found that Chromebooks effectively support the operational aspects of digital literacy, with most students able to operate devices independently and access digital learning resources. In addition, students exhibited increased visual creativity using digital tools and design features. The paper also revealed that more complex competencies, such as evaluating the credibility of information and producing original ideas, remain insufficiently developed. This suggests that technological integration alone is not sufficient and must be complemented by pedagogical strategies that explicitly foster critical and creative thinking.

Beyond instructional practices, the use of Chromebooks has also been explored within the context of digital assessment systems. Saparudin (2026) conducted a SWOT analysis of Chromebook utilization in the implementation of the computer-based National Assessment (ANBK) at the elementary school level. The findings indicate that Chromebooks offer several advantages, including ease of use, cost efficiency, and compatibility with web-based assessment platforms. It also identifies notable limitations, particularly the reliance on stable internet connectivity and restricted storage capacity. In addition, external factors such as technical disruptions, limited user training, and infrastructural constraints pose significant challenges. These findings highlight the necessity of strategic planning and institutional preparedness to ensure the effective adoption of digital technologies in educational assessment.

■ METHOD **Research Design**

This study employed a qualitative case study design to examine the governance of Chromebook procurement within Indonesia's education digitalization program. A case study was selected because it enables an in-depth investigation of a contemporary phenomenon within its real-life context by integrating evidence from multiple documentary sources.

The case examined in this study covers the Chromebook and Chrome Device Management (CDM) procurement program implemented by the Ministry of Education, Culture, Research, and Technology during the 2019-2022 procurement period, while public investigation and legal proceedings occurred later, particularly from 2025 onward. This distinction between the procurement period and the legal-investigative period is maintained throughout the analysis to ensure chronological consistency. The qualitative approach facilitates the examination of procurement governance, corruption risks, decision-making processes, and institutional interactions that cannot be adequately explained through quantitative methods (Mackintosh, 2026).

Data Sources

This study relied exclusively on secondary data obtained from multiple documentary sources. The dataset comprised five categories of evidence: (1) Public procurement regulations and government policy documents related to education digitalization. (2) Official investigation reports, prosecution documents, press releases, and public statements issued by the Attorney General's Office (Kejaksaan Agung Republik Indonesia) concerning the Chromebook procurement case. (3) Procurement-related reports and investigative publications issued by Indonesia Corruption Watch (ICW). (4) News articles published by national media outlets, including *Kompas*, *Tempo*, *CNN Indonesia*, *Antara*, and *Kontan*. (5) Peer-reviewed academic literature addressing public procurement, corruption governance, education digitalization, technology adoption, and public-sector accountability.

Documents were collected between January and June 2026. The document search covered materials published between 2019 and 2026, corresponding to the planning, implementation, investigation, and legal proceedings associated with the Chromebook procurement program. Academic publications were identified through Google Scholar, Scopus-indexed databases, and Crossref.

The inclusion criteria comprised documents that directly addressed the Chromebook procurement program, procurement governance, corruption allegations, legal proceedings, procurement regulations, or education digitalization policy in Indonesia. Documents unrelated to the Chromebook procurement case, duplicate reports, opinion articles without verifiable evidence, and publications lacking identifiable institutional or academic sources were

excluded from the analysis.

Legal accountability was examined using publicly accessible legal documents, including official investigation reports, prosecution documents, press releases, and public statements issued by the Attorney General's Office. Because the judicial process was still ongoing during the data collection period and complete court judgments were not yet publicly available, the legal analysis was limited to official documents issued by authorized government institutions.

Data Analysis Procedure

The collected documents were analyzed using qualitative content analysis to identify patterns of procurement governance, corruption risks, institutional interactions, and technology adoption. The analytical procedure followed three sequential stages: data reduction, data organization and coding, and thematic interpretation. During the coding process, evidence from different documentary sources was systematically compared to identify recurring themes, inconsistencies, and relationships across the procurement process.

Source triangulation was incorporated into the analytical process by systematically comparing evidence obtained from government regulations, official investigation reports, procurement documents, investigative media publications, and peer-reviewed academic literature. Information from each source was examined against the others to identify consistent findings, differences in interpretation, and complementary evidence related to procurement governance, corruption risks, institutional interactions, and technology adoption. Themes were developed only after comparing evidence across these documentary sources, allowing the analysis to capture the complexity of the Chromebook procurement process from multiple institutional perspectives.

To avoid overstating the scope of the evidence, the analysis distinguishes between direct documentary findings and theoretical interpretation. Negotiated Order Theory and the Fraud Triangle are used to interpret governance interactions and corruption-risk mechanisms found in documentary sources. By contrast, TAM is used only as a secondary interpretive lens for identifying documented conditions that may influence perceived usefulness and perceived ease of use. Because this study did not conduct surveys, interviews, or classroom observations with teachers and students, it does not directly measure actual user acceptance, intention to use, or perceived ease of use.

Table 1. Integrated matrix of procurement stages, actors, vulnerable practices, and corruption risks in chromebook procurement

Stage	Actors involved	Vulnerable practice (informal mechanism)	Potential risk and governance impact
Planning/needs assessment	Decision-making officials, project authorities, technical or administrative staff	Closed internal coordination, budget mark-up, fabricated or inflated needs, and disregard of field-readiness data	Abuse of authority, budget misallocation, and procurement plans disconnected from school infrastructure needs.
Technical specification drafting	Decision-making officials, technical team, external corporations, or consultants	Specification locking toward particular operating systems, devices, or CDM requirements; technical documents aligned with informal directives.	Collusion, conflict of interest, restricted competition, and mismatch with classroom, internet, and software needs
Vendor selection/e-catalogue / tender	Procurement committee, vendors or suppliers, and decision-making officials	Informal proposals to enter the e-catalog, limited tender participants, and restricted vendor access	Pseudo competition, tender manipulation, selected-vendor dominance, and reduced value for money
Contract implementation/distribution	Vendors or suppliers, project implementers, and administrative staff	Quality reduction, quantity mismatch, delayed delivery, and contract deviation	State financial loss, goods not matching the contract, unequal distribution, and weaker service quality
Evaluation/reporting/oversight	Evaluators or auditors, administrative staff, and decision-making officials	Manipulated work reports, weak tracing of vendor performance, and rationalization of deviations	Concealed losses, weak accountability, difficulty tracing irregularities, and declining public trust

■ RESULT AND DISCUSSION

Social Structure and Organizational Culture on Corruption Practices in Public Procurement

Position Organizational culture and social structure within public bureaucracies play a crucial role in shaping corruption practices, particularly in the context of public procurement. When organizations allow deviant practices to become routine, corruption is no longer perceived as misconduct but rather as an integral part of everyday work culture (Sulaiman & Darmawan, 2021). A permissive culture, weak norms of accountability and shame, and narrow group loyalty can serve as internal drivers that reinforce systemic corruption (Putri, 2023). According to Rahayu (2023), even in the implementation of electronic procurement systems, the effectiveness of corruption prevention largely depends on organizational values and the integrity of human resources. When organizational culture does not support transparency, actors may still exploit loopholes, particularly in early stages such as technical specification setting or vendor selection. This is

supported by Lestari (2022), who found that corruption in procurement does not solely originate from system weaknesses but also from informal agreements among actors that create mutually beneficial arrangements.

The Organization for Economic Cooperation and Development emphasizes that organizations failing to institutionalize collective integrity values are unlikely to develop effective anti-corruption systems. Hierarchical and closed social structures tend to increase the likelihood of collusion and behind-the-scenes arrangements. Nugroho and Wahyuni (2020) demonstrate that informal relationships among staff, particularly within procurement units, can form networks that are more influential than formal organizational structures. Both structural and cultural transformations are essential elements in corruption prevention efforts. Bureaucratic reform cannot rely solely on technical policies. However, it must also address the development of collective norms, the reinforcement of ethical work practices, and the dismantling of tolerance toward misconduct. Such transformation requires strong leadership and

value-based internal control mechanisms.

This phenomenon illustrates that corruption in public procurement does not emerge suddenly but is constructed through the socialization of values within organizations. When organizational leaders adopt permissive attitudes toward misconduct or are directly involved in it, subordinates are more likely to perceive such practices as acceptable (Sulaiman & Darmawan, 2021). This situation is further exacerbated by paternalistic cultures that prioritize loyalty to superiors over adherence to rules or public interest. In public procurement contexts, collusion among actors is often justified under the pretext of efficiency or process acceleration, even though such practices undermine principles of transparency and accountability (Putri, 2023). Internal oversight systems frequently become ineffective when embedded within hierarchical, non-independent informal relationships.

Documentary evidence from official statements by the Attorney General's Office indicates that the shift toward Chromebook procurement was driven by a series of meetings and technical reviews in 2020. The Attorney General's Office stated that a closed Zoom meeting on 6 May 2020 discussed the use of Chromebooks/Chrome OS for TIK procurement, even though the procurement process had not yet begun. It further stated that on 6 June 2020, a technical team meeting was held to complete a second technical review that explicitly mentioned ChromeOS, after an earlier review had only compared the advantages of Windows and ChromeOS (Kejaksaan Agung Republik Indonesia, 2025a, 2025b). From the perspective of Negotiated Order Theory, these events represent informal renegotiations within a formal procurement process. Instead of relying solely on a neutral needs assessment, technical specifications were modified through internal coordination and actor relationships. The official investigation also described earlier meetings with Google Indonesia and subsequent arrangements regarding ChromeOS and Chrome Device Management, indicating alleged external influence on the procurement policy (Kejaksaan Agung Republik Indonesia, 2025b, 2025c).

Indicators of vendor dominance emerged, with companies such as Advan, Zyrexindo, and Evercross appearing to dominate the fulfillment of tailored technical specifications through the electronic catalog system. Indonesia Corruption Watch reported that the project was not listed in the General Procurement Plan System, indicating restricted access to open competition (ICW, 2023). This pattern is consistent with the

principles of Negotiated Order Theory, in which informal structures replace transparent processes, creating a systemic form of corruption in which formal legality is compromised through closed agreements among actors.

The impact of these informal strategies is evident in the total procurement value of approximately IDR 10 trillion, despite earlier pilot studies indicating a high risk of functional failure due to limited internet access (Sulaiman & Darmawan, 2021). The renegotiation of formal rules effectively shifted the original objective of education digitalization into a mechanism for allocating benefits to a limited group of actors. To prevent the disconnection of actor roles from procurement-stage risks, this study consolidates the interaction patterns in Table 1. The table links procurement stages, involved actors, vulnerable practices or informal negotiation mechanisms, potential corruption risks, and governance impacts into a comprehensive procurement-governance chain.

Source: Authors' synthesis based on Refansa and Azhar (2025), Jamil and Bangun (2025), Jayadi et al. (2026), and ICW (2023).

The interaction among actors identified in this study is conceptualized as a network of informal negotiations rather than as a set of isolated institutional roles. Figure 1 presents the interaction among decision-making officials, vendors, and technical or administrative staff, together with the relationships linking procurement decisions, technical specification formulation, and governance outcomes. These actors do not operate independently but interact through organizational and interpersonal relationships in which formal procedures are continuously negotiated. The interaction among these actors is reflected in practices such as specification locking, restricted competition, and other procurement arrangements that increase the risk of corruption in the Chromebook procurement process.

The findings identify several key mechanisms, including the renegotiation of technical specifications within internal forums, the selection of vendors through a restricted electronic catalog system, external intervention through corporate connections, and the marginalization of formal legitimacy in favor of informal agreements. Negotiated Order Theory provides a robust analytical framework to explain how corruption is not merely an isolated occurrence but is actively produced through interactions between formal and informal actors. These findings underscore the need for procurement reform to address informal institutional arrangements, reduce

behind-the-scenes negotiations, and strengthen transparency within electronic procurement systems.

Overview of Alleged Corruption in the Chromebook Procurement Case by the Ministry of Education, Culture, Research, and Technology

The Chromebook procurement program implemented by the Ministry of Education, Culture, Research, and Technology during the 2019-2022 period was designed as part of the national education digital transformation and was supported by a substantial budget allocation and broad regional distribution. The alleged corruption case therefore refers to procurement activities carried out during this implementation period, whereas 2025 refers to the period of public investigation and legal enforcement. The procurement scheme involved centralized planning, supplier selection through electronic tendering, and layered administrative oversight, which, in principle, should minimize the risk of irregularities.

In public-sector procurement, the complexity of procedures and the high contract value often create opportunities for abuse of authority and conflicts of interest. Existing literature indicates that procurement is one of the most corruption-prone sectors when transparency and accountability mechanisms are ineffective (Adam, 2024; Bauhr et al., 2020; Santos, 2025).

Allegations of corruption in the Chromebook procurement began to emerge following indications of irregularities in technical specifications, unit pricing, and vendor selection patterns. Initial reports suggest that technical requirements were tailored toward specific brands or vendors, thereby reducing market competition. This condition reflects a pattern of collusion between public officials and private sector actors, as frequently identified in studies of public procurement. Conceptually, such practices are consistent with the findings of Nur (2022), which highlight collusion as a dominant mode of corruption in government procurement.

The findings indicate that the alleged corruption in the Chromebook procurement

process reflects the interaction of the three dimensions of the Fraud Triangle. Pressure is associated with budget realization targets and demands for the rapid distribution of educational devices. Opportunity is evident in weaknesses within the technical evaluation, procurement oversight, and financial control processes. Rationalization appears in the normalization of procurement practices that deviate from established procedures and are accepted within large-scale government projects (Kagias et al., 2022).

A more comprehensive analysis can be conducted using the Fraud Diamond model by incorporating capability as an additional factor in the occurrence of fraud. Capability is reflected in the actors' ability to control procurement processes, understand regulatory loopholes, and exploit electronic procurement systems. Actors with strong structural authority and technical expertise are more likely to conceal irregularities within contract documents and financial reports. This aligns with Wolfe & Hermanson (2004), who emphasize the importance of capability in enabling successful fraudulent actions.

Suspected irregularities are also evident in the potential mismatch between contract values and the quality of goods delivered. From a forensic accounting perspective, this condition represents a red flag that requires in depth examination of tender documents, invoices, and payment flows. Forensic research focuses not only on identifying state financial losses but also on uncovering transaction patterns and relationships among the parties involved. This approach has proven effective in analyzing public procurement cases in Indonesia (Panggabean & Pesudo, 2023; Suhartono & Jannah, 2021). Table 2 presents the summary of irregularity indicators identified in the Chromebook procurement process, including vulnerabilities in technical specifications, pricing, tender participation, and distribution mechanisms, to strengthen the data-driven analysis

Source : Jayadi et al. (2026)

Table 2 shows that suspected irregularities are interconnected across procurement stages. Nonneutral specifications can influence tender outcomes and directly

Table 2. Preliminary indications of alleged irregularities in chromebook procurement kemendikbudristek (2019-2022)

Procurement Aspect	Indicative Findings	Fraud Risk
Technical Specifications	Specifications directed toward specific vendors	Collusion and conflict of interest
Unit Price	Prices above market average	Budget markup
Tender Process	Limited number of participants	Pseudo competition
Distribution of Goods	Delays and mismatch in quantity	State financial loss

affect contract pricing. Limited participation in tender processes weakens market-based control mechanisms that would otherwise help ensure competitive pricing. These conditions reinforce the argument that transparency is a key instrument in reducing procurement corruption (Bauhr et al., 2020; Kohler & Dimancesco, 2020). Figure 2 presents a process flow and procurement risk diagram showing that alleged irregularities did not emerge at a single point in the procurement cycle but accumulated across successive procurement stages. The formulation of technical specifications and vendor selection appear to be the principal pathways through which governance weaknesses influenced subsequent procurement decisions. These conditions were associated with practices such as specification locking, restricted competition, and contract arrangements that limited transparency in procurement. The continuation of these interconnected processes into the contracting and distribution stages increased the likelihood of budget inefficiency and weakened oversight of technology implementation. Viewed as a sequential process-flow visualization, the diagram indicates that governance deficiencies developed cumulatively from the initial planning stage through the delivery of Chromebooks to schools rather than arising from isolated procedural violations.

Forensic accounting plays a critical role in disentangling these interconnected findings through document analysis and transaction reconstruction. This approach enables auditors to identify recurring vendor patterns, similarities in bidding structures, and hidden affiliations among participating entities.

Forensic tracing also includes cash flow analysis and the detection of potential money laundering derived from corrupt activities. Andriansyah (2023) emphasizes that forensic accounting is particularly effective in investigating complex financial crimes involving multiple actors.

The use of technology in public sector auditing further strengthens forensic accounting analysis in the Chromebook procurement case. Big data analytics enable the processing of large-scale tender, contract, and payment data to detect anomalies with greater accuracy. The integration of audit trail controls also enhances the reliability of accounting information systems in recording data changes. Studies show that the combination of auditor competence and technological tools significantly improves the effectiveness of investigative audits (Basuki et al., 2025; Tinambunan et al., 2025; Wulandari, 2025).

The overview of alleged corruption in the Chromebook procurement case, which concerns the 2019-2022 period and was investigated through legal processes beginning in 2025, indicates systemic risks that require a comprehensive forensic approach. Forensic accounting serves not only as an evidentiary tool but also as a preventive instrument through early identification of risk patterns. Strengthening transparency, accountability, and data-driven oversight is essential for improving procurement governance. These findings are consistent with the literature that positions forensic accounting and investigative auditing as key pillars in combating corruption in the public sector (Suka, 2025; Rani et al., 2024).

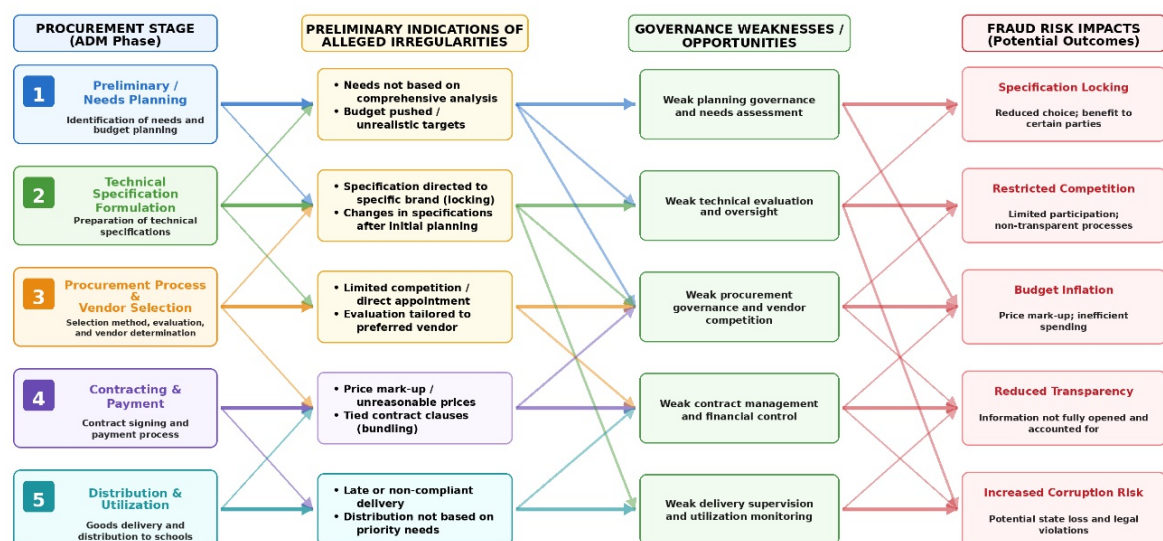


Figure 2. Process flow and procurement risk diagram of the relationships between procurement stages, alleged irregularities, governance weaknesses, and fraud risk in the chromebook procurement process

Risk Mapping of Corruption in the Education Digitalization Procurement Stages

The integrated matrix in Table 1 indicates that the highest concentration of risk occurs during the planning and technical specification drafting stages. These stages are often treated as internal technical domains, yet they define the parameters for budget allocation, eligibility criteria, vendor access, and product functionality. From the perspective of corruption law, abuse of authority may begin at this stage, when technical or budgetary discretion benefits particular parties and results in state losses, as contemplated in Article 3 of the Anti-Corruption Law.

Because weaknesses introduced during specification drafting carry over into later procurement phases, state loss should not be understood solely as a financial loss. It may also appear as reduced educational service quality, unequal access to digital resources, declining public trust, and the normalization of permissive procurement culture. For this reason, the risk-mapping discussion is no longer presented as a separate table; it is integrated into Table 1 to show how stages, actors, vulnerable practices, risks, and impacts operate as a single procurement-governance chain.

Corrupt practices in the procurement of education digitalization projects also affect unequal access to quality educational services. When digitalization projects intended to improve access and educational quality are instead hindered by corruption, the distribution of educational technology becomes uneven. This worsens disparities between better-resourced and under-resourced regions, widening the digital divide. The main goal of education digitalization, namely, to create an inclusive and equitable education system, becomes difficult to achieve and instead exacerbates existing social inequality.

The long-term effects of such corruption can damage the integrity and credibility of Indonesia's procurement system. If corruption in technology-based projects, including the digitalization of education, is not addressed seriously, public perceptions of government transparency and accountability may deteriorate further. The public and other stakeholders involved in procurement processes may increasingly lose trust in the system, which in turn may affect their active participation in oversight and reporting. Efforts to minimize corruption must include improvements to the procurement system, strengthened oversight mechanisms, and greater information transparency to restore public trust and create a cleaner, more efficient

procurement environment.

The Impact of Procurement Irregularities on Technology Adoption

The Chromebook procurement case demonstrates that procurement governance influences not only financial accountability but also the conditions under which educational technology is implemented in schools. In this section, the Technology Acceptance Model (TAM) is used as a conceptual perspective, not as a direct empirical test of user acceptance. This distinction is important because TAM typically relies on perceptual data on perceived usefulness and perceived ease of use, whereas this study relies exclusively on documentary evidence. Therefore, the analysis interprets documented procurement and implementation conditions that may potentially influence technology adoption, rather than measuring the actual attitudes of teachers or students (O'Dea, 2025).

The analysis of procurement documents and official investigation reports indicates that the formulation of technical specifications affected the functional characteristics of the distributed Chromebook devices. Several documents describe limitations related to internet dependency, software compatibility, storage capacity, and the availability of supporting digital infrastructure. These documented implementation conditions correspond to factors that the TAM literature associates with perceived usefulness and perceived ease of use. This study treats those factors as potential adoption conditions only. It does not conclude that teachers and students actually perceived Chromebooks as useful or difficult to use, because no primary perception data were collected. The empirical claim is therefore limited to the existence of documented technical and organizational conditions that could shape user acceptance.

The documentary evidence also indicates that implementation varied considerably across schools due to differences in infrastructure readiness, connectivity, and institutional support. These conditions provide contextual indicators for a TAM-informed interpretation: where the operational environment does not support stable use, the technology may be less likely to be experienced as useful or easy to use. This remains an interpretive inference from documents and prior literature, not a finding based on direct responses from end users.

Previous studies have likewise reported that infrastructure limitations, inadequate institutional readiness, and device compatibility influence the implementation of educational

technology (Farida, 2026). These studies complement the documentary evidence analyzed in this research by providing empirical observations from educational settings. In contrast, the present study focuses on procurement governance and the institutional conditions surrounding technology implementation. Procurement decisions concerning technical specifications, vendor selection, and implementation planning establish the organizational conditions under which educational technology is deployed. In this sense, TAM serves as a theoretical bridge between procurement governance and potential adoption outcomes. At the same time, the empirical analysis remains grounded in documentary evidence rather than direct acceptance data.

Previous studies suggest that procurement irregularities are associated with lower public confidence in education digitalization policies. Trust is an important external factor in extended TAM discussions because it can influence users' intentions and behavior toward technology adoption (Gefen et al., 2003). Public reports and media coverage surrounding the Chromebook procurement case raised concerns that the digitalization program was influenced by interests beyond educational objectives. In the present study, these concerns are interpreted as contextual conditions that may affect institutional trust in government-led digitalization initiatives, rather than as direct evidence of teachers' or students' acceptance levels.

Recent research by Sukarno et al. (2024) supports this view, showing that e-government development plays an important role in controlling corruption, as illustrated by Singapore's experience. Kelso et al. (2024) similarly indicate that irregularities in digital device procurement can affect how educational actors evaluate the quality and legitimacy of technology programs. These findings are used here as supporting literature for a TAM-informed interpretation: procurement credibility may become an external condition that shapes acceptance. Nevertheless, the Chromebook case analysis in this article remains limited to documentary evidence and should not be read as a direct measurement of end-user adoption.

The Chromebook case shows that corruption in procurement has a dual implication. In addition to creating risks of state financial losses, procurement irregularities may also weaken the institutional and technical conditions required for meaningful educational technology adoption. A TAM-informed interpretation suggests that failures in public

procurement are not merely administrative problems; they may also create conditions that reduce the likelihood that distributed devices will be experienced as useful, accessible, and easy to integrate into classroom practice. Because this study uses secondary documentary data, the conclusion is framed as a theoretically informed interpretation of adoption conditions rather than a direct empirical finding about user perceptions. Procurement governance, therefore, constitutes an important institutional condition for the implementation of education digitalization programs, as decisions regarding planning, technical specifications, and vendor selection shape the operational environment in which educational technologies are deployed.

The Legal Proceedings and Accountability in the Chromebook Procurement Case

Legal accountability is an important dimension in evaluating the governance of the Chromebook procurement program, as it demonstrates how public procurement decisions are examined under Indonesia's anti-corruption enforcement mechanisms. The legal process surrounding the Chromebook procurement case focused on allegations that the formulation of technical specifications and procurement decisions benefited particular parties during the implementation of the education digitalization program. Publicly available legal documents, including official investigation reports, prosecution documents, and statements issued by the Attorney General's Office, describe allegations of procurement governance violations, abuse of authority, and state financial losses associated with the project.

Throughout the legal proceedings, differences emerged between the prosecution's legal arguments and the defense's explanations, particularly regarding the interpretation of procurement decisions, the existence of unlawful benefit, and the relationship between procurement policy and alleged state losses. These legal developments illustrate the complexity of establishing accountability in large-scale public procurement cases, where administrative discretion, technical decision-making, and criminal liability intersect. The prosecution subsequently sought a sentence of 18 years' imprisonment, a fine of IDR 1 billion, and compensation for alleged state financial losses arising from the Chromebook procurement program.

Compared with several other corruption cases involving high-ranking public officials, the sentence demanded in this case also appeared relatively harsh. Harvey Moies (President Commissioner of PT Multi Harapan

Utama) was sentenced to 20-years of imprisonment (Cristofel & Prasetyo, 2026; Anindita & Rahardiansyah, 2025), while Syahrul Yasin Limpo (former Minister of Agriculture) received a 12-year prison sentence in a corruption case involving abuse of authority and gratuities (Perkasaputra et al, 2023; Hermanto & Anwar, 2025). To provide a clearer comparison of sentencing patterns and state financial losses across major corruption cases involving ministers and high-ranking public officials during the administration of Indonesia's 7th President, Joko Widodo, Table 3 and Figure 3 summarize the positions of the defendants, estimated corruption values or state losses, and the judicial sentences imposed.

Table 3 and Figure 3 show that sentencing patterns in major corruption cases do not always follow a simple proportional relationship with the estimated amount of state financial loss. Some cases with very large losses do not necessarily result in much heavier sentences. In contrast, other cases with smaller quantified losses may still lead to severe punishment when they involve strategic public positions, abuse of authority, or broader public consequences. This comparison is important for the Chromebook procurement case because the alleged impact of the case cannot be reduced to fiscal loss alone. The procurement concerned a national education digitalization program, so its consequences also relate to public trust, unequal access to educational technology, infrastructure readiness, and the credibility of government-led digital transformation.

These disparities prompt inquiries concerning the uniformity of sentencing criteria in instances of corruption within public

procurement, especially in relation to the magnitude of governmental losses, the defendant's standing, and the robustness of the evidence submitted during the trial. Severe punishment may reflect the state's commitment to suppressing corruption in the digital education sector and strengthen the deterrent effect against abuse of authority in government procurement of goods and services. Imbalances in sentencing may also create perceptions of legal uncertainty and reduce public trust in the judicial system's objectivity. Studies on public procurement governance indicate that the success of corruption eradication is determined not solely by the severity of punishment but also by the transparency of procurement processes, the strengthening of supervisory mechanisms, and the consistent enforcement of the law against all actors involved.

■ DISCUSSION OF LEARNING BENEFITS AND GOVERNANCE RISKS

The literature reviewed in this study shows that Chromebooks have real pedagogical potential when they are embedded in well-designed learning activities. Noriyana et al. (2024) found significant gains in students' critical reasoning in science learning through a pretest–posttest design, while Kamba et al. (2024) reported stronger reading engagement and concentration when Chromebooks were used with the Let's Read application. Similar patterns appear in Mudasir and Noor (2025), who observed higher cognitive, emotional, and behavioral engagement as well as better mathematics and science outcomes, and in Trianus et al. (2026), who noted gains in

Table 3. Comparative analysis of sentencing and state financial losses in major Indonesian corruption cases (2020-2026)

Name	Position	State Loss / Corruption Value	Sentence
Juliari Batubara	Former Minister of Social Affairs	Received kickbacks totaling IDR 32.4 billion; ordered to repay IDR 14.5 billion	12 years imprisonment
Edhy Prabowo	Former Minister of Marine Affairs and Fisheries	Received bribes totaling IDR 24.6 billion and US\$77 thousand	5 years imprisonment
Johnny Gerard Plate	Former Minister of Communication and Informatics	State losses estimated at IDR 8.03 trillion	15 years imprisonment
Syahrul Yasin Limpo	Former Minister of Agriculture	Ordered to repay IDR 44.27 billion and US\$30 thousand	12 years imprisonment
Harvey Moeis	President Commissioner of PT Multi Harapan Utama (MHU)	State losses estimated at IDR 300 trillion	20 years imprisonment
Nadiem Makarim	Former Minister of Education, Culture, Research, and Technology	Alleged state losses estimated at US\$125.64 million / IDR 2.18 trillion	18 years imprisonment (not yet final)

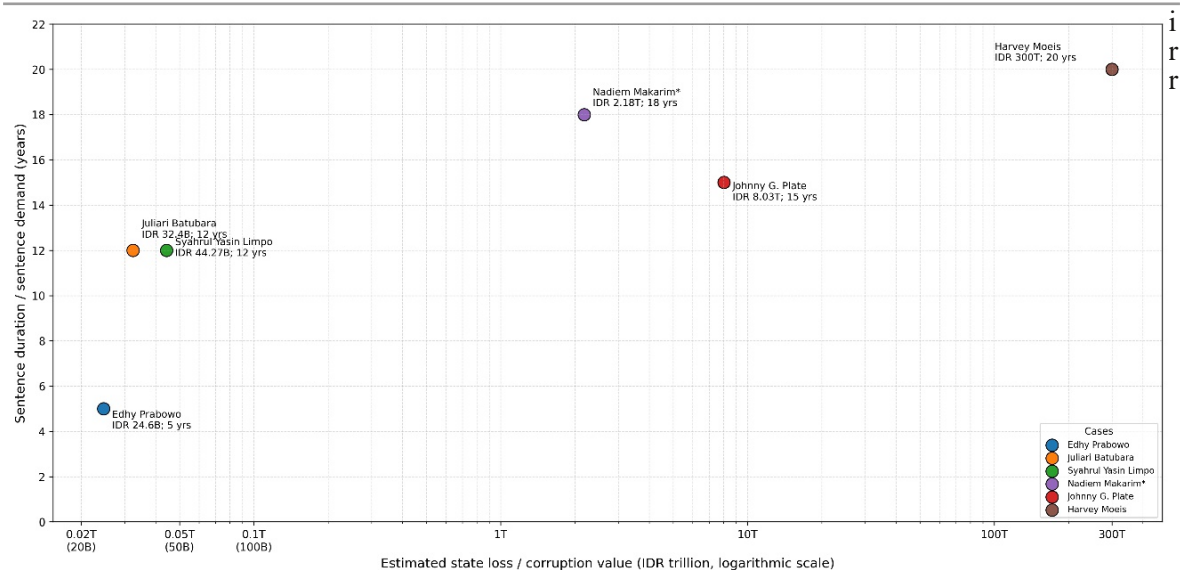


Figure 3. Scatter plot of estimated state financial losses and sentence duration in major Indonesian corruption cases (2020–2026)

operational digital literacy and visual creativity. Saparudin (2026) further showed that Chromebooks can support ANBK implementation because of their ease of use and compatibility with web-based assessment platforms. Together, these studies suggest that the educational value of Chromebooks emerges only when access, pedagogy, and infrastructure are aligned.

The same body of evidence reveals persistent implementation limits. Kamba et al. (2024), Mudasir and Noor (2025), Trianus et al. (2026), and Saparudin (2026) all emphasize technical barriers, unstable internet connectivity, teacher readiness, and the fact that Chromebooks may improve operational skills more readily than higher-order evaluation or original creativity. This means that technology adoption should not be equated with meaningful transformation in learning. In the present case, the Chromebook procurement problem demonstrates that educational technology can generate benefits only when implementation is matched with training, curriculum adaptation, and local infrastructure; otherwise, devices risk becoming symbolic assets rather than instructional tools.

Farida (2026) and Jayadi et al. (2026) show that education procurement is highly vulnerable to mark-up, collusion, weak internal control, and manipulation of procurement documents, while Hafiz and Hamidah (2026) and Jamil and Bangun (2025) argue that the Chromebook case reflects abuse of discretion, weak oversight, and the need for stronger anti-corruption governance. Hamid and Sukanta (2025) explain the normalization of these

regularities through Broken Windows Theory, and Refansa and Azhar (2025) show that corruption can be sustained through a negotiated informal order among bureaucrats and vendors. These studies indicate that the Chromebook issue is not merely a procurement inefficiency but a systemic governance failure.

This integrated literature supports the main argument of the present study. Chromebook procurement should be evaluated simultaneously as an educational intervention and as a public procurement process. When procurement is transparent and context-sensitive, Chromebooks can support reasoning, literacy, engagement, digital literacy, and assessment readiness, as shown by Noriyana et al. (2024), Kamba et al. (2024), Mudasir and Noor (2025), Trianus et al. (2026), and Saparudin (2026). When procurement is distorted by technical specification locking, collusion, and weak accountability, as shown by Farida (2026), Jayadi et al. (2026), Hafiz & Hamidah (2026), Jamil and Bangun (2025), Hamid & Sukanta (2025), and Refansa and Azhar (2025), the same technology may undermine institutional trust and create implementation conditions that are less supportive of adoption. This statement is not intended as a direct TAM measurement of teachers' or students' perceptions, but as an interpretation of documented governance and implementation conditions through a TAM-informed framework. Thus, the core issue is not Chromebook technology per se, but the governance architecture that determines how, for whom, and under what conditions the technology is procured and used.

■ CONCLUSION

This study demonstrates that the Chromebook procurement program for education digitalization reflects broader governance challenges rather than merely technical procurement issues. The findings indicate that the highest corruption risks occurred during the planning and technical specification stages, where budget inflation, specification locking, limited vendor competition, and informal negotiations among institutional actors created conditions that undermined procurement integrity. These findings suggest that procurement irregularities were embedded within organizational processes and institutional interactions rather than arising solely from individual misconduct.

The analysis also shows that weaknesses in procurement governance influenced the implementation of education digitalization by affecting procurement planning, technical specifications, vendor selection, and the distribution of digital devices. The documentary evidence indicates that the effectiveness of educational digitalization depends not only on the provision of technological resources but also on transparent procurement procedures, accountable decision-making, and procurement policies aligned with operational requirements within educational institutions. Strengthening procurement governance through greater transparency, institutional accountability, effective oversight, and the development of objective technical specifications remains essential to reducing corruption risks and improving the implementation of public-sector digitalization programs.

■ DECLARATION OF GENERATIVE AI IN SCIENTIFIC WRITING

During the preparation of this manuscript, the authors utilized ChatGPT by OpenAI to assist in refining sentence structure, improving grammar, and enhancing the clarity of academic writing in English. After using this tool, the authors carefully reviewed, revised, and validated all content and take full responsibility for the manuscript's final version.

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