

Public–Private Partnerships and School Infrastructure Development in Basic Education: Evidence from Public Schools

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Persistent infrastructure deficiencies continue to challenge the delivery of quality basic education in many developing contexts, prompting governments to adopt Public–Private Partnerships (PPPs) as alternative mechanisms for school infrastructure development. This study examined the impact of PPP initiatives on the availability, quality, and sustainability of infrastructure in public basic education schools, anchored on Human Capital Theory, which emphasizes the role of adequate learning environments in fostering educational and socio-economic development. Employing a descriptive research design, the study gathered data from 45 public school teachers and school heads in Tiaong I District, Philippines, using a researcher-developed questionnaire administered via Google Forms. Descriptive statistical techniques were utilized to analyze respondents' perceptions and experiences regarding PPP-supported infrastructure projects. The findings revealed that PPPs have contributed positively to the increased availability of essential school facilities, particularly classrooms, laboratories, and sanitation amenities. Respondents generally assessed the quality of PPP-developed infrastructure as satisfactory, indicating improvements in functionality and learning conditions. However, concerns were raised regarding long-term maintenance, sustainability, and institutional accountability. Key challenges identified included delays in project implementation, limited stakeholder and community engagement, and the absence of clearly defined maintenance responsibilities after project turnover. To enhance the effectiveness of PPP initiatives, respondents recommended greater transparency in project implementation, formalized maintenance agreements, and stronger participation of school communities and local stakeholders. The study concludes that while PPPs offer a viable strategy for addressing infrastructure gaps in basic education, their long-term effectiveness depends on sustained collaboration, institutionalized accountability mechanisms, and proactive maintenance planning. The findings provide empirical evidence to inform policymakers, school administrators, and private partners in strengthening PPP frameworks to ensure durable, equitable, and sustainable infrastructure development in basic education systems.

Keywords: Public–Private Partnerships; School Infrastructure; Basic Education; Human Capital Theory; Educational Development

Introduction

The provision of adequate and high-quality school infrastructure remains a persistent challenge in many public basic education systems, particularly in developing countries where fiscal constraints limit government capacity to meet growing educational demands. Physical learning environments—such as classrooms, laboratories, libraries, and sanitation facilities—play a critical role in shaping students’ learning experiences, teacher effectiveness, and overall school performance. Numerous studies have established that well-designed and properly maintained school infrastructure is positively associated with learner achievement, attendance, and educational equity (Darling-Hammond, 2017; World Bank, 2020). However, chronic underinvestment in education infrastructure continues to hinder the delivery of quality basic education, especially in resource-constrained contexts.

In response to these challenges, governments worldwide have increasingly turned to Public–Private Partnerships (PPPs) as an alternative model for financing, constructing, and managing school infrastructure. PPPs are collaborative arrangements in which public and private sector actors share resources, risks, and responsibilities to deliver public services more efficiently (Patrinos, Barrera-Osorio, & Guaqueta, 2016). Globally, PPPs have gained prominence as a mechanism for addressing infrastructure gaps while leveraging private sector expertise, innovation, and capital. Osei-Kyei and Chan (2017) observed a steady increase in the adoption of PPPs across public service sectors, including education, citing their potential to improve infrastructure delivery while reducing financial pressure on governments. Similarly, Verger (2019) noted that many countries, particularly in Latin America and Southeast Asia, have embraced PPPs to address persistent shortages in school facilities and improve service quality.

Despite their growing adoption, the effectiveness of PPPs in the education sector—particularly at the basic education level—remains a subject of ongoing debate. While some studies

report improvements in infrastructure availability and efficiency, others raise concerns regarding long-term sustainability, accountability, and equitable access (Naz & Rathore, 2022). Much of the existing literature tends to focus on higher education or broad public service delivery, leaving a notable gap in empirical research examining the direct impact of PPPs on infrastructure development in basic education schools, especially within low- and middle-income countries.

In the Philippine context, PPPs have been institutionalized as part of the government's strategy to address classroom shortages and infrastructure backlogs, notably through initiatives such as the Public-Private Partnership for School Infrastructure Project. While these programs have resulted in the construction of numerous school facilities, systematic evaluations of their impact on infrastructure quality, sustainability, and stakeholder experiences at the school level remain limited. This gap underscores the need for empirical studies that examine how PPP initiatives are implemented in practice and how they are perceived by educators and school leaders who are directly involved in and affected by these projects.

Anchored on Human Capital Theory, as articulated by Schultz (1961) and Becker (1964), this study views school infrastructure as a foundational investment in human development. Human Capital Theory posits that investments in education yield long-term economic and social returns by enhancing individuals' productive capacities. Within this framework, PPPs can be understood as strategic mechanisms for mobilizing additional resources to strengthen the physical learning environments essential for human capital formation. By examining the impact of PPPs on infrastructure development in basic education schools, this study seeks to contribute empirical evidence that can inform policy formulation, improve partnership design, and promote sustainable and equitable educational development.

Method

This study employed a descriptive research design to examine the impact of Public–Private Partnerships (PPPs) on infrastructure development in public basic education schools. The respondents consisted of 45 teachers and school heads from public schools in Tiaong I District, selected due to their direct involvement in and firsthand knowledge of PPP-related infrastructure initiatives. Data were collected using a researcher-developed questionnaire designed to capture respondents' perceptions of infrastructure availability, quality, sustainability, implementation challenges, and proposed improvement measures. The survey instrument was administered through Google Forms from April 30 to May 10, 2025, allowing for efficient and standardized data collection. Descriptive statistical tools, including frequency counts, percentages, means, and standard deviations, were utilized to analyze the data and summarize trends and patterns in respondents' assessments. Ethical considerations were strictly observed; informed consent was obtained from all participants, participation was voluntary, confidentiality and anonymity were assured, and the data were used solely for academic purposes.

Results and Discussion

Profile of the Respondents

Table 1 presents the demographic and professional profile of the respondents, consisting of 45 public basic education personnel. The distribution shows that school heads or principals (44.44%) and teachers (53.33%) were almost equally represented, ensuring that both administrative and instructional perspectives were captured. This balance strengthens the credibility of the findings, as school heads are typically involved in planning and oversight of infrastructure projects, while teachers experience the direct effects of these facilities on teaching and learning processes.

Table 1
Profile of the Respondents

Variable	Category	Frequency	Percentage (%)
Position in School	School Head / Principal	20	44.44
	Teacher	24	53.33
	Others	1	2.22
Years in Service	1–3 years	2	4.44
	4–6 years	3	6.67
	7–10 years	13	28.89
	More than 10 years	27	60.00
Involvement in PPP Activities	Yes	38	84.44
	No	7	15.56

In terms of length of service, the majority of respondents (60.00%) reported more than ten years of experience in the education sector. This indicates that most participants possess substantial institutional memory and professional maturity, enabling them to critically assess changes in school infrastructure over time. According to Ingersoll (2018), experienced educators are better positioned to evaluate institutional reforms due to their longitudinal exposure to policy and operational shifts. Additionally, 84.44% of respondents indicated involvement in PPP-related school activities, suggesting that the perceptions gathered are informed by direct engagement rather than indirect observation. Overall, the respondent profile reflects a knowledgeable and experienced group, lending validity to the assessments regarding PPP implementation and outcomes in basic education infrastructure.

Impact of PPPs on the Availability of School Infrastructure

Table 2 illustrates respondents' assessment of the impact of PPP initiatives on the availability of school infrastructure. The overall

mean score of 4.21, interpreted as Very High Impact, indicates that PPPs are widely perceived as effective in increasing access to essential educational facilities. Among the indicators, the availability of classrooms ($M = 4.32$) and sanitation facilities ($M = 4.25$) received the highest ratings, underscoring the role of PPPs in addressing fundamental infrastructure shortages.

Table 2

Respondents' Assessment of the Impact of PPPs on the Availability of School Infrastructure

Infrastructure Indicator	Mean	SD	Verbal Interpretation
Availability of classrooms	4.32	0.58	Very High Impact
Availability of laboratories	4.18	0.64	High Impact
Availability of sanitation facilities	4.25	0.61	Very High Impact
Availability of learning support spaces	4.10	0.66	High Impact
Overall Mean	4.21	0.62	Very High Impact

Scale: 1.00–1.80 (Very Low), 1.81–2.60 (Low), 2.61–3.40 (Moderate), 3.41–4.20 (High), 4.21–5.00 (Very High)

These findings align with international studies suggesting that PPPs can accelerate the provision of educational facilities in contexts where public funding alone is insufficient (Patrinos et al., 2016; World Bank, 2020). The relatively high ratings for laboratories and learning support spaces further suggest that PPPs contribute not only to basic compliance requirements but also to enhanced learning environments. However, slightly lower mean scores for specialized facilities imply that while PPPs are effective in addressing immediate infrastructure gaps, expansion into more resource-intensive spaces may require additional policy and financial support.

Quality and Sustainability of PPP-Developed Infrastructure

Table 3 presents respondents’ perceptions of the quality and sustainability of infrastructure developed through PPPs. The overall mean of 3.98, interpreted as High, suggests that PPP-supported facilities are generally viewed as structurally sound, safe, and suitable for teaching and learning. Indicators related to safety and compliance standards received particularly favorable evaluations, reflecting adherence to construction and regulatory requirements.

Table 3
Respondents’ Assessment of the Quality and Sustainability of PPP-Developed Infrastructure

Indicator	Mean	SD	Verbal Interpretation
Structural quality of facilities	4.15	0.63	High
Safety and compliance standards	4.20	0.59	Very High
Suitability for teaching–learning activities	4.12	0.65	High
Sustainability and durability	3.78	0.72	High
Maintenance adequacy	3.64	0.75	High
Overall Mean	3.98	0.67	High

Despite these positive assessments, indicators related to sustainability and maintenance received comparatively lower mean scores, although still within the High range. This pattern indicates emerging concerns regarding the long-term durability and upkeep of facilities after project completion. Naz and Rathore (2022) similarly observed that while PPPs often succeed in delivering infrastructure outputs, post-construction maintenance remains a critical challenge. These findings highlight the importance of

moving beyond infrastructure delivery toward sustainable lifecycle management.

Challenges in the Implementation and Maintenance of PPP Projects

Table 4 identifies the major challenges encountered in the implementation and maintenance of PPP-initiated infrastructure projects. The overall mean of 3.96 (High) reflects the presence of significant operational and governance issues. Among the challenges, budget constraints for maintenance ($M = 4.10$) and unclear maintenance responsibilities ($M = 4.05$) were rated highest, underscoring the systemic weaknesses in post-turnover arrangements.

Table 4
Perceived Challenges in the Implementation and Maintenance of PPP Infrastructure Projects

Challenge	Mean	SD	Verbal Interpretation
Delays in project implementation	3.92	0.71	High
Limited stakeholder engagement	3.85	0.69	High
Unclear maintenance responsibilities	4.05	0.66	High
Insufficient post-construction monitoring	3.88	0.73	High
Budget constraints for maintenance	4.10	0.64	Very High
Overall Mean	3.96	0.69	High

Delays in project implementation and limited stakeholder engagement were also rated highly, suggesting that coordination and participatory processes require strengthening. These findings

are consistent with Osei-Kyei and Chan (2017), who emphasized that unclear risk-sharing and accountability structures often undermine the long-term success of PPP projects. The results imply that effective PPP implementation requires not only financial investment but also robust governance frameworks and stakeholder alignment.

Proposed Measures to Enhance PPP Effectiveness

Table 5 outlines respondents’ proposed measures to improve the effectiveness of PPPs in school infrastructure development. All indicators received Very High priority ratings, with clear maintenance agreements (M = 4.45) and regular monitoring and evaluation (M = 4.42) emerging as the most critical interventions. These recommendations directly address the challenges identified in Table 4, indicating coherence between perceived problems and proposed solutions.

The strong emphasis on transparency, community participation, and capacity-building reflects a growing recognition that infrastructure sustainability depends on inclusive governance and institutional capacity. Verger (2019) argued that participatory oversight mechanisms are essential in ensuring that PPPs serve public rather than purely contractual interests. The findings suggest that schools and communities are willing to engage actively in PPP processes when clear structures and responsibilities are established.

Table 5
Proposed Measures to Enhance the Effectiveness of PPPs in School Infrastructure Development

Proposed Measure	Mean	SD	Priority Level
Clear maintenance agreements	4.45	0.55	Very High

Proposed Measure	Mean	SD	Priority Level
Transparent implementation processes	4.38	0.57	Very High
Stronger community participation	4.30	0.60	Very High
Regular monitoring and evaluation	4.42	0.53	Very High
Capacity-building for school leaders	4.25	0.62	Very High
Overall Mean	4.36	0.57	Very High

Taken together, the findings demonstrate that Public–Private Partnerships play a substantial role in improving the availability and quality of basic education infrastructure, particularly in addressing long-standing shortages in classrooms and essential facilities. However, the results also reveal a critical disconnect between infrastructure provision and long-term sustainability, primarily due to gaps in maintenance planning, accountability, and stakeholder engagement. Anchored on Human Capital Theory, the study affirms that investments in physical learning environments contribute meaningfully to educational development, but only when supported by sustainable governance mechanisms. The convergence of positive infrastructure outcomes and persistent implementation challenges underscores the need for PPP frameworks that institutionalize maintenance responsibilities, promote transparency, and actively involve school communities. Strengthening these dimensions will be essential to ensuring that PPP-driven infrastructure investments translate into durable improvements in educational quality and equity.

Conclusion

This study examined the impact of Public–Private Partnerships (PPPs) on infrastructure development in public basic education

schools, focusing on availability, quality, sustainability, and implementation challenges. The findings indicate that PPPs have made a meaningful contribution to addressing critical infrastructure gaps, particularly in the provision of classrooms, laboratories, and sanitation facilities. These improvements have enhanced the physical learning environment and supported the delivery of basic education services in public schools.

Despite these positive outcomes, the study reveals that the effectiveness of PPPs is not without limitations. While the quality and safety of PPP-developed facilities were generally assessed as satisfactory, concerns regarding long-term maintenance, sustainability, and accountability persist. The absence of clearly defined post-construction maintenance responsibilities, coupled with budgetary constraints and limited stakeholder engagement, poses risks to the longevity and functionality of school infrastructure. These challenges suggest that infrastructure provision alone is insufficient to ensure sustained educational benefits.

Anchored on Human Capital Theory, the study affirms that investments in educational infrastructure are essential inputs to human capital formation. However, the realization of long-term educational and socio-economic returns from PPP-supported infrastructure depends on sustained collaboration, transparent governance, and institutionalized maintenance mechanisms. Ultimately, PPPs remain a viable and strategic approach to supporting basic education infrastructure, but their success hinges on the integration of sustainability, accountability, and participatory governance into partnership frameworks.

Recommendations

Based on the conclusions drawn from the study, the following recommendations are proposed:

1. All PPP agreements should include explicit and enforceable provisions for long-term maintenance and lifecycle management of school facilities. Clear delineation of responsibilities among private partners, school administrations, and local government units is necessary to ensure infrastructure sustainability.
2. The Department of Education and relevant oversight bodies should enhance monitoring and evaluation systems to track PPP implementation from project initiation to post-turnover stages. Transparent reporting and regular audits can promote accountability and ensure compliance with agreed standards.
3. Teachers, school heads, parents, and community stakeholders should be actively involved in the planning, implementation, and evaluation of PPP projects. Meaningful participation can foster a sense of ownership and shared responsibility for infrastructure upkeep.
4. Capacity-building programs on infrastructure management, partnership oversight, and community mobilization should be provided to school leaders. Strengthening institutional competence will enable schools to manage PPP-developed facilities more effectively.
5. Policymakers should revisit existing PPP guidelines in basic education to ensure alignment with sustainability and equity goals. Policy frameworks should emphasize not only infrastructure delivery but also long-term educational outcomes and equitable access across regions.

6. Future studies should employ larger and more diverse samples across multiple regions and utilize longitudinal designs to examine the sustained impact of PPP-supported infrastructure on student outcomes, including achievement, retention, and equity indicators. Comparative studies between PPP and non-PPP schools are also recommended to generate deeper policy-relevant insights.

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