# Challenges and Dilemmas of Digitalization in Philippine Education: A Grassroots Perspective

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## Abstract

The shift towards digitalization in the Philippine education system has highlighted opportunities and challenges, particularly at the grassroots level. This study explored the systemic barriers hindering digital learning, focusing on the lived experiences of educators, and students. Using a phenomenological research design, data were gathered through focus group discussions and interviews with participants from underserved areas, including educators from geographically isolated regions and students facing socio-economic challenges. Thematic analysis revealed three major findings: (1) significant infrastructure and technological barriers, including poor internet connectivity, lack of devices, and inadequate school resources; (2) socio-economic disparities that exacerbate the digital divide, affecting both students' academic performance and teachers' instructional methods; and (3) dilemmas faced by educators and learners in adapting to digital methods, ranging from insufficient training to personal and systemic constraints. Recommendations include establishing a Unified Digital Education Ecosystem through a Public-Private Partnership model, integrating tools for teaching and learning, enhancing broadband infrastructure, and providing affordable devices. This study underscores the need for a holistic, inclusive approach to digitalization, promoting equity and efficiency in education while addressing the unique challenges of underserved communities. The findings aim to inform policy development and improve the implementation of digital education programs in the Philippines.

**Keywords:** Digitalization in education, Philippine education system, socio-economic disparities, infrastructure barriers, digital divide, online learning challenges, grassroots perspective, teacher preparedness, student engagement, educational policy development, digital learning adaptation.

## 1. Introduction

The shift towards digitalization in the Philippine education system has gained increasing

attention due to the transformative potential of integrating digital tools into traditional teaching and learning processes. This issue is critical because it holds the potential to bridge the gaps in educational access, quality, and efficiency, particularly in a country with such diverse socio-economic and geographical conditions. The global trend towards educational technology, accelerated by the COVID-19 pandemic, has underscored the importance of digital literacy and the capacity to engage with digital platforms. In the Philippines, the problem is compounded by existing infrastructure deficits and inequities in access to technology, making this topic urgent and necessary for exploration.

Digital learning has become a pivotal element in the modernization of education, with significant research examining its impact, especially in developed countries. However, there is an evident gap in studies focusing on Southeast Asia, particularly the Philippines, where systemic challenges present unique barriers to adopting digital learning. These challenges include inadequate infrastructure, varying levels of teacher readiness, and pronounced regional disparities.

Several studies highlight the effects of digital learning adoption, especially in response to the pandemic. For instance, Barrot et al. (2021) identified significant challenges students face, such as internet connectivity issues and limited access to digital devices. The study also underscores the uneven digital infrastructure across regions in the Philippines, reflecting broader socio-economic inequalities.

Moreover, teacher readiness plays a crucial role in the success of digital learning initiatives. Turrohmah and Suryanto (2023) examined teachers' preparedness for digital transformation in education, identifying gaps in digital literacy and technological adaptation. These findings are particularly relevant to the Philippine context, where digital literacy among teachers varies significantly across regions, exacerbating existing disparities.

Furthermore, the pandemic-induced shift to online learning has highlighted long-standing issues such as infrastructure inadequacies and the digital divide. The research by Baticulon et al. (2020) explored barriers to online learning, emphasizing that students in remote areas often face difficulties accessing reliable internet connections, which hampers their educational outcomes. These issues are closely tied to the geographical and socio-economic landscape of the Philippines, where regional disparities are a significant concern.

This study sought to explore the challenges encountered in the digitalization of the Philippine education system, particularly from a grassroots perspective. It aimed to investigate the systemic barriers that hindered the successful implementation of digitalization initiatives, focusing on the experiences and insights of educators and students. The inquiry centered on the infrastructure and technological barriers that impeded the integration of digital learning in local schools, especially in underserved areas, where limited access to technology and internet connectivity posed significant obstacles.

Additionally, the study examined how socio-economic inequalities and regional disparities further complicated the adoption of digital tools, exacerbating the challenges students and teachers face at the grassroots level. Educators, in particular, encountered specific dilemmas

as they adapted to digital teaching methods, with varying levels of preparedness and access to resources impacting the effectiveness of the digitalization program. By uncovering these challenges and dilemmas, the study aimed to provide insights that could inform more effective policy development for the Philippine Digitalization Program.

## 2. Method

### 2.1 Research Design

This study utilized a phenomenological research design to explore the lived experiences of educators and students regarding the challenges of digitalization in the Philippine education system. Phenomenology was chosen to capture how participants experienced the barriers, dilemmas, and responses to digital learning at the grassroots level. In-depth interviews were conducted to gather firsthand insights into the technological and socio-economic challenges. This approach allowed for a deeper understanding of the common themes that emerged from their experiences, offering valuable insights to inform more effective policy development for the Philippine Digitalization Program.

### 2.3 Sampling

This study used purposive sampling to select participants who could provide relevant insights into the challenges of digitalization at the grassroots level. The initial sample included 11 participants: 4 educators and 7 students from underserved areas, who underwent a Focus Group Discussion (FGD). These participants were chosen based on their direct experiences with digital learning, infrastructure issues, and socio-economic challenges, ensuring a diverse range of perspectives critical to understanding the impact of the digitalization program.

To explore experiences related to digitalization more deeply, the researchers also conducted online interviews with five additional teachers from geographically isolated and disadvantaged areas. These teachers were from Kalinga, Pangasinan, Dinagat Island, Zamboanga, and the Bicol Region. Their inclusion provided a more comprehensive understanding of how digitalization initiatives are perceived and implemented in regions with unique socio-cultural and infrastructural constraints, enriching the study with diverse narratives and contextual insights.

Similarly, to capture learners' perspectives, the researchers conducted online interviews with 4 students from Pangasinan, Aurora, and the Bicol Region. These students shared their experiences with digital learning, focusing on access to technology, connectivity challenges, and how digitalization has impacted their education. This combination of FGDs and individual interviews ensured that the study captured collective and individual insights, providing a holistic view of the grassroots realities of digitalization.

### 2.4 Instrument

The research instrument used in this study was a structured qualitative questionnaire with open-ended questions. It targeted students and teachers, focusing on their experiences with digital education. For students, the questions explored challenges like internet access and device availability, the impact on schoolwork, and suggestions for improvement. For teachers,

the questions addressed their difficulties with digital teaching methods, the perceived effect on student engagement, and the support needed. The open-ended format allowed for detailed, narrative responses, which were analyzed to identify key themes and dilemmas. It was validated through an external review process.

An external validator, education, and digital learning expert assessed the instrument to ensure the questions were clear, relevant, and aligned with the study's objectives. This validation process focused on verifying the appropriateness of the content, ensuring the instrument effectively captured the challenges and experiences related to digital education from both students and teachers. Feedback from the external validator was incorporated to refine the questionnaire, enhancing its validity and ensuring the accuracy and reliability of the data it collected.

*2.6 Data Gathering Procedure*

The data-gathering procedure involved conducting focused group discussions (FGDs) with student and teacher participants, with separate schedules for each group to allow for focused conversations on their unique experiences with digital education. The FGD was organized for the students to explore their challenges with accessing online learning, the impact of these challenges on their academic performance, and their suggestions for improving digital education, particularly in underserved areas. The session encouraged open dialogue, allowing participants to share personal experiences and insights.

A separate FGD was held for the teachers to discuss their dilemmas in adapting to digital teaching methods, including technological barriers, student engagement issues, and their need for institutional support. The teachers were also asked to provide recommendations for improving the digitalization program.

A moderator facilitated both FGDs, and participants were encouraged to engage in a structured but open-ended discussion, ensuring that rich, qualitative data was gathered. The sessions were recorded with participants' consent, and the data were later transcribed for thematic analysis. This method allowed the researchers to capture in-depth insights from both groups while maintaining a clear distinction between the challenges faced by students and teachers.

The researchers also conducted individual interviews with key informants to deepen the study further through an online platform. These included two teachers assigned to the computer laboratories in two public schools and an ICT coordinator. The individual interviews aimed to explore specific roles and responsibilities, such as the challenges and successes of managing computer laboratories in digital education.

The teachers provided valuable input on their day-to-day experiences, highlighting operational barriers, technical issues, and their perceptions of student engagement during laboratory sessions. Meanwhile, the ICT coordinator shared insights on the broader implementation of digital education in the schools, including infrastructure readiness, policy alignment, and support mechanisms. These interviews complemented the FGDs by offering a more personalized perspective on the digital education landscape, ensuring a richer and more

comprehensive understanding of the participants' experiences. By combining the group dynamics of FGDs with the focused depth of individual interviews, the researchers ensured that the data gathered were both wide-ranging and detailed, enabling a more nuanced thematic analysis.

*2.7 Data Analysis*

The data analysis employed thematic analysis to interpret the responses from the FGDs and individual interviews. This approach enabled the researchers to identify and analyze patterns within the qualitative data systematically. Data analysis from the FGDs and the interviews was conducted simultaneously to streamline the process and ensure consistency. This allowed the researchers to understand the participants' experiences and perspectives holistically while avoiding redundancy or compartmentalization in the analysis.

After transcribing the recorded FGDs and interviews, the researchers meticulously reviewed the transcripts to identify significant phrases, expressions, and ideas aligned with the study's objectives. Codes were assigned to these key phrases, the building blocks for identifying recurring themes. By analyzing the data from the students, themes such as "infrastructure challenges," "accessibility issues," and "academic impact" were identified, providing a detailed view of the barriers students encountered and their implications for online learning. Similarly, data from the teachers revealed themes like "adaptation difficulties," "technological barriers," "student engagement issues," and "institutional support needs," reflecting the multifaceted challenges teachers faced in implementing digital education.

By integrating the analysis of the FGDs and interviews, the researchers were able to draw connections between the shared and unique experiences of students and teachers. This method highlighted each group's specific dilemmas and their interconnected impact on the broader digitalization program. The comprehensive and simultaneous analysis ensured that the qualitative data from all sources were synthesized effectively, enabling the identification of nuanced insights and actionable recommendations for improving digital education, particularly in underserved areas.

## 3. Results

*3.1 Key Infrastructure and Technological Barriers That Hinder the Implementation of Digital Learning in Local Schools.*

The students consistently reported significant challenges with infrastructure and technological barriers, primarily revolving around internet connectivity, access to devices, and electricity issues. One recurring theme was poor internet connectivity, as highlighted by a participant who shared, *"I have faced challenges with unreliable internet access, which makes it difficult to attend online classes consistently."* This issue was exacerbated in remote areas, where students reported climbing to elevated spots or traveling far distances to secure a stable connection. One student mentioned, *"Our house is in a remote area, and the weak internet forces me to go to town, 4 kilometers away, to access online learning resources."* Another critical barrier was the lack of access to devices, such as laptops or smartphones, necessary for digital education. One student explained, *"My old laptop struggles with certain*

*learning platforms, causing delays in submitting assignments on time."* Others reported sharing or borrowing devices, limiting their ability to engage fully in online learning. Additionally, electricity issues emerged as a less frequent but significant barrier. In areas prone to power outages, students shared experiences of being unable to complete assignments or participate in online classes. One participant shared, *"During brownouts, I could not finish my homework or attend class because there was no electricity to power my devices or internet."* Despite these challenges, some students recognize the potential benefits of digital learning when infrastructure is adequate. They expressed frustration at how these barriers prevent them from fully realizing these opportunities, often leaving them at a disadvantage compared to peers in better-served areas.

On the other hand, teachers shared similar challenges but from a more systemic viewpoint, often emphasizing the impact on their ability to deliver effective instruction. One dominant theme was poor internet connectivity, which many teachers cited as a significant obstacle to conducting online classes. As one teacher described, *"The low internet speed means I cannot deliver the discussion clearly, which frustrates both me and the students."* This issue becomes especially problematic during critical moments, such as assessments or live sessions, where a stable connection is crucial. The lack of access to devices was another critical issue for teachers, though their focus was often on inadequate school resources rather than personal devices. One teacher noted, *"Our school lacks a proper computer room, and our computers are outdated, with low specifications, making them slow and unsuitable for digital teaching."* Another important theme was the lack of digital infrastructure within schools. Teachers described scenarios where schools lacked basic facilities like reliable Wi-Fi or functioning multimedia equipment, significantly hindering their ability to incorporate digital tools into their teaching. One teacher stated, *"School facilities are not ready, and without Wi-Fi, it is difficult for me to prepare lessons that align with the digital shift."* Teachers also highlighted the impact of socio-economic disparities among students, which indirectly affects their teaching. One teacher observed, *"Not all students can afford a laptop or stable internet, and it is challenging to engage them equally in online activities."* These disparities often force teachers to rely on traditional teaching methods alongside digital approaches, limiting the effectiveness of the digitalization program.

Both groups identified poor internet connectivity and lack of device access as critical barriers. This alignment underscores the systemic nature of these issues, affecting both teaching and learning. Participants from both groups shared firsthand experiences of how these barriers disrupted their routines, limited their participation, and created frustrations.

Additionally, both groups recognized the broader challenges posed by inadequate infrastructure in schools and homes, highlighting the need for government and institutional support to address these deficiencies.

While students focused on personal experiences—such as difficulty attending classes, completing assignments, or coping with unreliable devices, teachers often framed their challenges within systemic inadequacies. For example, teachers emphasized the lack of school-provided resources, such as computer rooms, functional equipment, and institutional

Wi-Fi, which they viewed as essential for facilitating effective digital learning.

Moreover, students frequently mentioned the direct impact on their academic performance and engagement: "*The weak internet makes me late in submitting assignments.*" In contrast, teachers highlighted the indirect impact of these barriers on their ability to deliver lessons and assess students effectively.

The findings from the thematic analysis of student and teacher responses on the barriers to digital learning align closely with existing literature on the challenges faced in implementing digital education in various regions. Several studies corroborate the identified issues, particularly the technological and infrastructural barriers. Unstable internet connectivity, especially in rural areas, is a significant obstacle for students and teachers, as highlighted in studies from regions like India and Australia (Sunil & Azimi, 2023; Marsden et al., 2023). Additionally, many students and educators lack access to essential devices such as laptops and smartphones, further limiting participation in digital education (Mukkaromah & Wijayanti, 2021). Another critical issue is the insufficient digital training for teachers, which hampers their ability to effectively use online tools and multimedia resources, as seen in Indonesia and other regions (Indriani et al., 2023; Redmond et al., 2021). Both students and teachers share frustrations about these challenges, though students often focus on navigating digital platforms, while teachers are concerned about the impact on teaching and student engagement. Addressing these barriers will require improved digital infrastructure, greater device access, and enhanced teacher training to ensure effective and inclusive digital learning (Elsayary, 2023).

*3.2 The Socio-Economic Inequalities and Disparities on the Challenges of Digitalization for Students and Teachers at the Grassroots Level*

The socio-economic inequalities and disparities in the challenges of digitalization for students and teachers at the grassroots level reveal profound obstacles that hinder the equitable implementation of digital education. For students, financial constraints, lack of resources, and unequal access to infrastructure dominate their narratives. Many students shared firsthand experiences that underscore the severity of these barriers. For instance, one student described their struggle with internet access, stating, *"Our house is in a remote area, and the weak internet forces me to go to town, 4 kilometers away, to access online learning resources."* Another student mentioned, *"During brownouts, I could not finish my homework or attend class because there was no electricity to power my devices or internet."* The lack of access to devices, such as laptops or smartphones, is another recurring issue, with one participant stating, *"My old laptop struggles with certain learning platforms, causing delays in submitting assignments on time."* These challenges are compounded by the socio-economic realities of many families who cannot afford to prioritize technology for education over basic needs. As a result, students from less privileged households often find themselves at a significant disadvantage compared to their peers, struggling to meet the demands of digital learning while lacking the necessary tools and support.

For teachers, the socio-economic disparities manifest differently but remain equally impactful. Teachers frequently emphasize unequal access among their students, directly affecting their

ability to teach effectively. One teacher observed, *"Not all students can afford a laptop or stable internet, and it is challenging to engage them equally in online activities."* This disparity forces teachers to adopt a hybrid approach, often relying on traditional teaching methods alongside digital tools, which dilutes the potential of fully implementing digital education. Beyond their students' challenges, teachers also face systemic issues. Many schools in grassroots areas lack the infrastructure and resources necessary for digital education. One teacher noted, *"Our school lacks a proper computer room, and our computers are outdated, with low specifications, making them slow and unsuitable for digital teaching."* Financial constraints exacerbate these issues, leaving schools and teachers to improvise solutions. For example, one teacher shared how they used their laptop to allow students to experience digital tools, saying, *"I let them use my laptop, and at least they can have the experience of using a laptop with the internet."* These systemic shortcomings hinder teachers' efforts and perpetuate the inequities their students face.

Both students and teachers identified financial constraints as a core issue, highlighting the shared impact of socioeconomic inequalities on digital education. Poor internet connectivity and lack of access to devices emerged as critical barriers for both groups, emphasizing the systemic nature of these challenges. However, their perspectives diverge in meaningful ways. Students often focused on the direct impact of these barriers on their academic performance and engagement. For instance, students spoke of missed deadlines, difficulties understanding lessons, and the frustration of being unable to keep up with peers. Teachers, on the other hand, framed their challenges within the broader context of systemic inadequacies. While they acknowledged their students' struggles, teachers emphasized the lack of institutional support, inadequate school infrastructure, and the need for better training and resources to address these disparities.

The differences in perspective highlight the layered nature of socioeconomic inequalities in digital education. These disparities are deeply personal for students, affecting their daily learning experiences and long-term academic outcomes. For teachers, these inequalities represent systemic barriers that limit their ability to provide equitable education to all students. Both groups, however, are united in their call for solutions that address these disparities at their root. Improving internet infrastructure, providing affordable or subsidized devices, and equipping schools with modern facilities are critical to reducing these inequalities. Additionally, targeted interventions, such as financial assistance for underprivileged families and training programs for teachers, could help bridge the digital divide and ensure that students and teachers at the grassroots level can fully participate in the digitalization of education. Addressing these challenges holistically would enhance the effectiveness of digital education and promote more significant equity and inclusivity in the learning experience.

The findings from the thematic analysis of student and teacher responses are well-supported by recent literature on socioeconomic inequalities and their impact on digital education. Various studies have emphasized how inadequate infrastructure, poor internet connectivity, and limited access to digital devices exacerbate the digital divide for economically disadvantaged students. For example, research on low-income Latino students in Silicon

Valley revealed that, despite understanding the importance of technology, socio-economic barriers significantly hindered access to online education, a situation further worsened by the COVID-19 pandemic (Kim & Padilla, 2020). Similarly, during the pandemic, students from low-income families in rural Zambia faced additional challenges, such as poor digital literacy and internet connectivity, limiting their ability to participate in virtual learning (Nyashanu et al., 2023). Teachers, particularly in underserved areas like Balochistan, Pakistan, also struggled with limited access to devices, weak internet, and a lack of training, impacting the quality of education they could provide (Gul et al., 2023). Moreover, disparities in digital education were evident in online courses in China, where socio-economic factors such as GDP were positively linked to student engagement, highlighting how MOOCs can sometimes exacerbate rather than mitigate educational disparities (Sun et al., 2022).

*3.3 The Dilemmas that Educators and Students Face in Adapting to Digital Teaching Methods and How These Impact the Effectiveness of the Digitalization Program*

The dilemmas that educators and students face in adapting to digital teaching methods reveal significant challenges that impact the overall effectiveness of the digitalization program. From the students' perspective, adapting to digital learning has been riddled with obstacles, many of which stem from inadequate infrastructure and personal limitations. One student explained, *"I have faced challenges with unreliable internet access, which makes it difficult to attend online classes consistently."* This issue, coupled with the lack of devices, creates a compounding effect; as another participant shared, *"My old laptop struggles with certain learning platforms, causing delays in submitting assignments on time."* Some students' lack of digital literacy further complicates their ability to navigate learning platforms and tools effectively. One participant admitted, *"Sometimes I find it hard to use the apps required for my classes because I do not know how to operate them properly."* Moreover, distractions at home and a lack of motivation further hinder their engagement; as one student described, *"Studying at home means dealing with distractions, which reduces my focus and comprehension."* These dilemmas undermine students' ability to adapt to digital learning fully, creating educational gaps and leaving them feeling left behind in the digital shift.

Educators, on the other hand, face personal and systemic dilemmas. One teacher highlighted that a primary challenge is internet connectivity: "*The low internet speed means I cannot deliver the discussion clearly, which frustrates both me and the students."* Many teachers also lack adequate training and confidence in using digital tools, with one participant stating, *"The challenge is you need to invest time and effort to know everything about digital teaching methods, like attending seminars and workshops."* Beyond their limitations, teachers are also burdened by the socio-economic disparities among their students, which significantly impact their teaching strategies. One teacher observed, *"Not all students can afford a laptop or stable internet, and it is challenging to engage them equally in online activities."* This forces teachers to constantly adjust their methods, often resorting to traditional approaches alongside digital tools, which dilutes the effectiveness of the digitalization program. Additionally, the lack of institutional support adds to their struggles. One teacher pointed out, *"School facilities are not ready, and without Wi-Fi, it is difficult for me to prepare lessons that align with the digital shift."* These dilemmas affect their ability to teach effectively and create

frustration and burnout among educators who feel ill-equipped to meet the demands of digital education.

Despite their different roles, students and teachers experience shared dilemmas reflecting the systemic issues plaguing the digitalization program. Poor internet connectivity and lack of access to devices are common challenges for both groups, highlighting the widespread inadequacy of digital infrastructure. Both groups also struggle with insufficient skills or training to adapt effectively to digital tools, albeit in different ways—students lack basic digital literacy. At the same time, teachers often require advanced training to integrate technology into their teaching effectively. Additionally, both students and teachers expressed frustration with the lack of institutional or governmental support, which exacerbates their struggles and limits the potential of the digitalization program.

However, there are notable differences in how these dilemmas manifest in each group. For students, the challenges are more personal and immediate, affecting their ability to engage in lessons, complete assignments, and perform academically. The impact is felt individually, with students often feeling disconnected and disadvantaged. Conversely, teachers view their dilemmas through a broader lens, emphasizing the systemic barriers that hinder their ability to deliver quality education. While students focus on their struggles with digital tools, teachers are more concerned with the disparities among their students and the lack of institutional resources that limit their teaching effectiveness.

In conclusion, the dilemmas students and teachers face are deeply intertwined, with each group's struggles reinforcing the other's challenges. Poor infrastructure, inadequate resources, and insufficient training undermine the effectiveness of the digitalization program, creating barriers that are felt across all levels of education. Addressing these dilemmas requires a holistic approach that includes improving internet connectivity, providing affordable devices, offering comprehensive training programs for students and teachers, and equipping schools with the necessary infrastructure. The digitalization program can only achieve its intended goal of providing equitable and practical education for all by addressing these interconnected challenges.

The thematic analysis of student and teacher responses regarding the challenges of adapting to digital teaching and learning methods is consistent with recent literature. A study on digital education in Germany highlights the dilemma of inadequate digital infrastructure, which parallels the issues faced in the Philippines, where students and teachers struggle with unreliable internet access and outdated devices (Zhang, 2022). Similarly, research on the digital resilience of students from diverse countries, including Australia and Cambodia, found that students faced difficulties adapting to online learning due to a lack of technological infrastructure and support, leading to disengagement and frustration (Eri et al., 2021). Furthermore, the challenges teachers face in adapting to new digital teaching platforms without proper training or resources are well-documented. Teachers are often required to manage their professional development while simultaneously trying to engage students in a digital environment, as seen in research on post-COVID teaching challenges (Hoechsmann, 2020). These studies underscore the critical need for improvements in digital infrastructure,

institutional support, and professional development to enhance the effectiveness of digital education programs and bridge the gap between students and teachers in underserved communities.

## 4. Recommendations

This study recommends the establishment of a Unified Digital Education Ecosystem in the Philippines, spearheaded by the Department of Education (DepEd) in collaboration with Public-Private Partnerships (PPPs). The proposed ecosystem aims to address the persistent challenges of digital education, such as inadequate infrastructure, socio-economic disparities, and limited access to resources while ensuring equitable and sustainable learning opportunities for all stakeholders.

The central feature of this ecosystem is a comprehensive digital platform that integrates tools for learning, teaching, and administrative functions. This platform should include e-grade books, secure communication channels, access to academic resources, and analytics tools to track student performance and support data-driven decision-making. The system must incorporate offline functionality, multilingual support, and features tailored to underserved communities to prioritize inclusivity. This ensures that students and teachers in remote or low-income areas can fully benefit from digital education.

The implementation of this ecosystem should follow a Public-Private Partnership model to maximize efficiency, scalability, and sustainability. DepEd, the leading public entity, would provide regulatory oversight, ensure alignment with educational standards, and monitor program outcomes. Private sector partners would handle the technical aspects, including platform development, maintenance, and the provision of training programs for educators and administrators. Local Government Units (LGUs) would play a critical role in supporting infrastructure development, such as internet connectivity and school electricity, and facilitating resource allocation at the community level. Non-Governmental Organizations (NGOs) and community stakeholders would contribute by raising awareness, addressing socio-economic barriers, and mobilizing additional resources such as devices and connectivity.

The program's success would be measured through its ability to deliver tangible benefits to all stakeholders. The ecosystem would provide students with personalized learning pathways, gamified experiences, and improved access to high-quality resources, enabling greater engagement and academic success. For teachers, it would offer tools to streamline administrative tasks, freeing up time for effective instruction, alongside professional development programs to enhance digital literacy and pedagogy. Parents would benefit from real-time access to their children's progress, fostering a stronger partnership between home and school. For DepEd, the system would create a unified database for monitoring educational performance, improving resource allocation, and supporting evidence-based policy-making.

To ensure the sustainability and effectiveness of this initiative, the following steps are essential: (1) nationwide expansion of broadband infrastructure to improve internet

connectivity in remote areas; (2) provision of affordable or subsidized digital devices for students and teachers; (3) establishment of community learning hubs with free Wi-Fi and shared resources; and (4) continuous monitoring and evaluation to refine and enhance the system over time.

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