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Bridging the Digital Divide: Evaluating Schools Strategies for Increasing Access

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ABSTRACT

This study evaluated the strategies employed by public elementary schools in bridging the digital divide and increasing access to digital resources. Specifically, it described the demographic profile of participating schools in terms of location, school size, and school type, and determined the extent of strategies implemented in terms of availability of digital resources, accessibility for all learners, integration in classroom instruction, capacity building and digital literacy, school–community partnerships, and sustainability of initiatives, as assessed by teachers, Parent-Teacher Association (PTA) representatives, and learners. Using a quantitative descriptive-comparative research design, data were collected from 1,222 respondents and analyzed using descriptive statistics, t-tests, and analysis of variance. Results revealed that the majority of respondents were from rural, non-central, and medium-sized schools. Overall, all three groups of respondents rated the strategies employed by schools as implemented to a very great extent across all six indicators. School-community partnerships and availability of digital resources consistently obtained the highest ratings, while sustainability of initiatives, although still rated very highly, obtained comparatively lower mean scores. Comparative analysis showed no significant differences in most indicators when schools were grouped according to location and type. However, significant differences were noted in sustainability of initiatives as perceived by learners. When grouped according to school size, learners' perceptions showed significant differences across all indicators, while teachers and PTA representatives exhibited significant differences only in selected areas. Based on these findings, an intervention program was formulated to further strengthen the sustainability and effectiveness of school strategies in bridging the digital divide.

Keywords: Digital divide, School-Community Partnerships, Rural and Urban Education, Digital Inclusions

How to Cite:

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INTRODUCTION

Technological advancements have significantly influenced education, particularly in teaching, learning, and school management through the use of digital tools and online resources. However, unequal access to these resources among students and schools has led to what is known as the digital divide. This gap not only affects academic performance but also contributes to broader social and economic inequalities, placing learners with limited access at a disadvantage in a knowledge-based society.

In recent years, the integration of technology in education has presented both opportunities and challenges. While the Department of Education continues to introduce digital tools, limitations in infrastructure, connectivity, and teacher training remain evident. These challenges highlight the need to evaluate the effectiveness of existing strategies aimed at bridging the digital divide. Socioeconomic status also plays a significant role in shaping individuals' access to and use of technology (Passaretta & Gil-Hernández, 2023). Students from low-income households are more likely to have limited internet access, which affects both their academic performance and development of digital literacy skills (Afzal et al., 2023).

Moreover, schools often face challenges such as inadequate internet connectivity, unstable power supply, and insufficient funding for updated technologies. These limitations restrict access to quality digital learning resources and hinder the development of essential digital competencies (Gómez-Fernández & Mediavilla, 2022; Kim et al., 2021). As a result, students in under-resourced schools are at a disadvantage in developing the skills necessary for the digital age (Joseph & Uzondu, 2024).

Despite various initiatives to improve digital access, gaps in implementation and sustainability remain. This underscores the need to assess whether current strategies effectively reach learners and contribute to long-term educational outcomes. Thus, this study aims to evaluate the strategies employed by public elementary schools in addressing the digital divide and improving access to digital resources.

LITERATURE REVIEW

Incorporating technology into teaching presents many benefits that greatly improve the processes of instruction and learning. It offers a range of learning materials that cater to various learning preferences, allowing teachers to provide a wide array of resources tailored to the specific needs of each student (Elliyani & Nurhasanah, 2025). According to Cortazar et al. (2021), the integration of technology enhances access to extensive information sources, empowering learners to take more initiative in their educational journey. Furthermore, interactive technological tools such as simulations, videos, and educational games can capture students' interest and maintain engagement in learning activities (Baht, 2023). Digital tools including online discussion forums, video conferencing platforms, and collaborative software facilitate real-time communication and break down geographical barriers, thereby promoting active participation, group collaboration, and peer learning (Elliyani & Nurhasanah, 2025).

The availability of digital resources plays a crucial role in ensuring effective technology integration in schools. Access to digital tools and infrastructure allows students and teachers to participate actively in digital learning environments. However, limited technological resources and inadequate infrastructure remain common barriers to technology integration in many schools.

Researches showed that students in rural and underprivileged areas often experience limited access to digital devices, poor internet connectivity, and insufficient technological resources, which significantly contribute to the persistence of the digital divide. Similarly, Parveen et al. (2024) and Tamam and Aminudin (2025) highlighted that insufficient infrastructure and limited access to internet services remain major challenges in implementing digital inclusion strategies, particularly in marginalized communities.

Despite efforts to promote ICT integration through initiatives such as the School Computerization Program, teacher training, and IT curriculum development, the Department of Education (DepEd) still faces challenges in sustaining ICT-based instruction and ensuring equal access to digital resources in schools (Mula & Bucar, 2023).

According to Zou et al. (2025), stakeholders in education must work collaboratively to create inclusive learning environments that maximize the benefits of digital technologies while ensuring equitable access for all learners. Barria-Pineda et al. (2022) further emphasized that addressing accessibility challenges requires coordinated efforts from governments, educational institutions, and private sectors to provide scalable and cost-effective technological solutions.

In addition, integrating technology into classroom instruction enhances students' learning experiences and supports innovative teaching strategies. As students navigate increasingly complex digital environments, educators are responsible for equipping them with the necessary skills to evaluate information critically, collaborate in digital spaces, and create digital content (Brooks et al., 2023; Murcia et al., 2018).

In the Philippine context, many teachers' experiences with digital education focus on the challenges they encountered during the implementation of online learning and the strategies they used to overcome these difficulties. In Bacolod City, educators reported that the availability and effective use of accessible technologies are essential for successfully integrating digital tools into classroom instruction (Petalla, 2022).

The Department of Education established programs aimed at improving the competencies of teachers and school leaders in integrating technology into teaching and learning. The successful implementation of digital education initiatives requires collaboration among various stakeholders within the school community. According to Murugi and Mugwe (2023), developing and implementing a school's strategic plan requires active participation from different stakeholders involved in school governance and management.

There has been an increasing global trend toward stronger stakeholder involvement in educational decision-making and policy development (Lopez & Bauyot, 2025). Such collaboration allows schools to integrate diverse perspectives from parents, community members, and other stakeholders in addressing educational challenges.

However, the absence of meaningful stakeholder participation may hinder a school's ability to align its goals and initiatives with the needs and aspirations of the community (Darrel et al., 2020; Gichohi, 2015). Conversely, collaborative engagement among stakeholders promotes shared responsibility in achieving educational goals and improving learning opportunities for students (De Torres, 2021).

Ensuring the sustainability of ICT initiatives is essential for maintaining long-term digital transformation in education. Effective digital learning requires collaboration among educators, students, and technology providers to ensure that digital tools are both user-friendly and aligned with pedagogical objectives (Fernández et al., 2024).

Overall, sustaining digital initiatives also requires continuous investment in infrastructure, teacher training, and technological support. Barria-Pineda et al. (2022) emphasized that governments, educational institutions, and private organizations must work together to provide sustainable and scalable digital learning solutions that address existing technological gaps.

SYNTHESIS

The reviewed literature highlights the growing importance of digital technologies in improving teaching and learning processes. However, the persistence of the digital divide continues to limit equitable access to digital resources, particularly among students in disadvantaged communities. Existing studies have extensively examined the challenges associated with digital inequality, technology integration, and teacher readiness in digital education.

Despite these findings, limited research has focused specifically on the strategies implemented by schools to address the digital divide. Schools play a critical role in bridging this gap through initiatives such as improving access to digital resources, promoting inclusive learning opportunities, strengthening teacher digital competencies, and establishing partnerships with community stakeholders. Therefore, examining the strategies employed by public elementary schools to improve the digital divide is essential for developing effective and sustainable digital education programs.

METHODOLOGY

Research Design

This study utilizes quantitative descriptive research design through descriptive survey method. The research is focused on collecting numerical data to identify the schools' strategies and students' access. Quantitative research designs centre on numerical data collection and analysis to answer the research question or hypothesis. This is achieved through the application of objective, systematic and thorough processes to generate knowledge. Descriptive designs are more structured and specific, have clearly defined research questions or hypotheses and while not setting out to establish causality, they do seek to provide a clear picture of the subject area. (Slater, P., & Hasson, F. 2024).

Respondents of the Study

In the selection of respondents, different groups of stakeholders will be involved to ensure that the perspectives gathered represent both school-level decision-makers and learners. Specifically, one hundred fifty-six (156) Teachers and one (1) Parent-Teacher Association (PTA) representative from each of the 50 elementary schools in the Division of Cadiz City will be included. These respondents will be chosen because teachers are directly involved in the integration of technology in schools, while PTA representatives provide valuable insights from the parents' perspective.
Meanwhile, one thousand one hundred sixteen (1,116) Grades 4 to 6 learners will also serve as respondents since they are already capable of expressing their experiences and viewpoints regarding the use of ICT in learning. To identify the respondents,

stratified random sampling for selecting learners is employed, this is to ensure that respondents are proportionally represented across different grade levels, maintaining fairness and reducing bias in the selection process. A purposive sampling was used for determining the PTA representatives, as they hold specific roles relevant to the study. Moreover, a total enumeration was used for Teachers. This combination of total enumeration, purposive, stratified random sampling methods allows the study to gather both targeted and representative data, which will help ensure the credibility and reliability of the findings.

Research Instrument

There were three (3) separate instruments used in this study: namely for teacher-respondent, PTA representative, and learners. These research instrument used is a researcher-made instrument. The tool is composed of two sections. The first section deals with demographic profiling of the respondents including their role, name of the school they are affiliated with, location of the school, school size, and school type. The second section of the instrument highlights the main objective of the study. This is where the respondents assess the strategies schools are implementing to address the digital divide in terms of availability, accessibility of digital resources, integration of digital devices, capacity building and literacy, school community partnership, and sustainability of initiatives from 5- Very Great Extent, 4 – Great Extent, 3 – Moderate Extent, 2 - Low Extent, and 1 - Very Low Extent.

Validity and Reliability

The instrument of this research is subjected to a validation process and is evaluated using Lawshe (1975) content validity ratio. Content validation refers to a process that aims to provide assurance that an instrument (checklist, questionnaire, or scale) measures the content area it is expected to measure (Frank-Stromberg & Olsen, 2004 cited in Ayre & Scally, 2013). Experts in digital media, education research, and ICT will assess the survey items. These specialists will evaluate if the questions adequately address all of the study's major topics, including the application of ICT strategies to address the digital divide among schools. Their input will guarantee that the poll covers every pertinent facet of strategies of schools to address digital divide. The instrument is presented to nine (9) validators who are experts in the field of educational research for suggestions and evaluation. Upon undergoing into content validity test ration, the instrument acquired 0.93 content validity index which indicates that the instrument is highly valid.

Cronbach's Alpha was used to measure the internal consistency of the survey items. Cronbach's Alpha is a widely used statistic that assesses how well a set of items measures a single, underlying construct. It ranges from 0 to 1, with higher values indicating greater reliability. In testing the reliability of the research instrument, a reliability test was conducted to thirty (30) identified teachers in Old Sagay Elementary School, Division of Sagay City. The Cronbach's Alpha Reliability Test was used to gather, tabulate, and compute the data in order to determine the alpha value and determine the instrument's reliability. The results revealed that all subscales demonstrated excellent reliability. Specifically, the Availability of Digital Resources subscale obtained a Cronbach's alpha of .960, while Accessibility of Digital Resources yielded .951. The Integration of Digital Devices subscale recorded an alpha of .965, and Capacity Building and Digital Literacy obtained .969. Similarly, School Community and Partnership showed a reliability coefficient of .976, while Sustainability Initiatives registered the highest alpha value of .983. Overall, the entire instrument achieved a Cronbach's alpha of .993, indicating very high internal consistency. Based on the established criteria, all values fall within the "excellent reliability" range ($r \geq .90$), suggesting that the questionnaire items are highly consistent and reliable in measuring the intended constructs.

Data Gathering Procedure

Prior to conducting the study, the researcher sent a letter requesting authorization from Cadiz City's Schools Division Superintendent. The researcher gave the questionnaires to the intended respondents after the letter was approved. The research instrument was distributed through a hard copy. Respondents had ample time to consider how they answered the instruments. The completed surveys were collected, totaled, tabulated, and examined using the relevant statistical software.

Data Analysis

This study generally aimed to evaluate the strategies employed by public elementary schools in the Division of Cadiz City to address the digital divide and enhance access to digital resources for the school year 2025-2026. Specifically, the study sought to determine the demographic profile of respondents, the extent of strategies employed by schools, and whether these strategies significantly differed when grouped according to school demographics. To achieve these objectives, appropriate statistical tools were applied to analyze the data collected from learners, teachers, and PTA representatives. To describe the demographic characteristics of respondents in terms of school location, school size, and school type, frequency counts and percentages were utilized. Frequencies provided information on the number of respondents in each category, while percentages allowed for easy comparison across groups.

To determine the extent to which schools employed strategies to address the digital divide, the study applied mean scores and standard deviations. The indicators included availability of digital resources, accessibility for all learners, integration in classroom instruction, capacity building and digital literacy, school-community partnerships, and sustainability of initiatives.

Scale	Interval	Interpretation
5	4.21–5.00	Very Great Extent
4	3.41–4.20	Great Extent
3	2.61–3.40	Moderate Extent
2	1.81–2.60	Low Extent
1	1.00–1.80	Very Low Extent

To assess whether the extent of strategies differed according to school location, school type, or school size, the study employed inferential statistics. Independent Samples t-Test was used for comparing the mean scores of two groups (e.g., rural vs. urban or central vs. non-central) for learners, teachers, and PTA representatives. This test determined whether observed differences in strategy implementation were statistically significant at $\alpha = 0.05$. One-Way Analysis of Variance (ANOVA) was applied for comparing mean scores across more than two groups (e.g., school size: large, medium, small) for learners, teachers, and PTA representatives. ANOVA tested whether differences in the extent of strategies across school sizes were statistically significant at the 0.05 level.

Ethical Considerations

Privacy and anonymity of the respondents' profile will be guaranteed in this research study. The identity of the respondents and the results will be treated in a confidential manner. Informed consent will be given and will be accomplished by the respondents informing them of the nature of the study and stipulating that they can withdraw from the course of survey.

RESULTS AND DISCUSSION

This section presents the analysis and interpretation of data based on the perceptions of teachers, PTA representatives, and learners on the effectiveness of school strategies in bridging the digital divide. It also describes the profile of the participating public elementary schools in terms of location, school size, and school type.

Moreover, it examines the extent of strategies employed in improving digital access, including availability, accessibility, integration, capacity building, partnerships, and sustainability, as well as the significant differences when grouped according to demographic profiles and respondents. The findings serve as the basis for the development of an intervention program to strengthen schools' efforts in addressing the digital divide.

Table 1

Distribution of Respondents According to School Location, Size, and Type

Respondents	Location (Rural/Urban)	Size (Large/Medium/Small)	Type (Non-Central/Central)	Total
Learners	Rural: 802 (78.9%) Urban: 214 (21.1%)	Large: 448 (44.1%) Medium: 414 (40.7%) Small: 154 (15.2%)	Non-Central: 802 (78.9%) Central: 214 (21.1%)	1,016
Teachers	Rural: 119 (76.3%) Urban: 37 (23.7%)	Large: 33 (21.2%) Medium: 98 (62.8%) Small: 25 (16.0%)	Non-Central: 119 (76.3%) Central: 37 (23.7%)	156
PTA Representatives	Rural: 46 (92.0%) Urban: 4 (8.0%)	Large: 4 (8.0%) Medium: 38 (76.0%) Small: 8 (16.0%)	Non-Central: 46 (92.0%) Central: 4 (8.0%)	50

Note. The scale used in interpreting the extent of strategies was as follows: 4.21–5.00 = Very Great Extent; 3.41–4.20 = Great Extent; 2.61–3.40 = Moderate Extent; 1.81–2.60 = Low Extent; and 1.00–1.80 = Very Low Extent.

The majority of respondents were affiliated with **rural and non-central schools**. Learners were almost evenly distributed between large (44.1%) and medium-sized (40.7%) schools, while teachers and PTA representatives were primarily from **medium-sized** schools (62.8% and 76.0%, respectively). Overall, these results indicate that the study findings largely reflect the

context of **rural, non-central, medium-sized schools** within the Division of Cadiz City, though perspectives from urban and small schools are also represented, providing a comprehensive understanding of the respondent population.

Table 2

Extent of Strategies Employed by Public Elementary Schools to Improve the Digital Divide as Evaluated by Learners (N=1016)

	Mean	Std. Deviation	Interpretation
A. Availability of digital resources	4.628	.187	Very Great Extent
B. Accessibility for all learners	4.617	.208	Very Great Extent
C. Integration in classroom instruction	4.583	.210	Very Great Extent
D. Capacity building and digital literacy	4.645	.207	Very Great Extent
E. School-community partnerships	4.729	.202	Very Great Extent
F. Sustainability of initiatives	4.495	.196	Very Great Extent

Note. The scale used in interpreting the extent of strategies was as follows: 4.21–5.00 = Very Great Extent; 3.41–4.20 = Great Extent; 2.61–3.40 = Moderate Extent; 1.81–2.60 = Low Extent; and 1.00–1.80 = Very Low Extent.

All indicators were rated to a Very Great Extent (M = 4.495–4.729), indicating strong implementation of strategies to address the digital divide. School–Community Partnerships obtained the highest rating, while Sustainability of Initiatives had the lowest, though still high. The high ratings in availability and accessibility suggest that schools are providing sufficient and inclusive digital resources, consistent with Castaño-Muñoz et al. (2025) and Thapaliya and Panta (2025). The strong integration of technology in instruction further supports effective learning engagement, aligning with Navas-Bonilla et al. (2025). Similarly, the high-rating in-capacity building reflects the importance of digital literacy in maximizing technology use (Zulaikha et al., 2024). The prominence of school–community partnerships highlight the role of collaboration in expanding access (Yousofi et al., 2025). However, the relatively lower rating in sustainability implies that maintaining these initiatives remains a challenge, particularly in terms of long-term funding and infrastructure (Ramírez-Correa et al., 2025). Overall, learners perceive that schools are effectively addressing the digital divide, but sustained support is necessary to ensure continuity.

Table 3

Extent of Strategies Employed by Public Elementary Schools to Improve the Digital Divide as Evaluated by Teachers (N=156)

	Mean	Std. Deviation	Interpretation
A. Availability of digital resources	4.754	.241	Very Great Extent
B. Accessibility for all learners	4.621	.247	Very Great Extent
C. Integration in classroom instruction	4.542	.257	Very Great Extent
D. Capacity building and digital literacy	4.530	.214	Very Great Extent
E. School-community partnerships	4.533	.179	Very Great Extent
F. Sustainability of initiatives	4.520	.152	Very Great Extent

Note. The scale used in interpreting the extent of strategies was as follows: 4.21–5.00 = Very Great Extent; 3.41–4.20 = Great Extent; 2.61–3.40 = Moderate Extent; 1.81–2.60 = Low Extent; and 1.00–1.80 = Very Low Extent.

All indicators were rated to a Very Great Extent (M = 4.520–4.754), reflecting teachers' strong perception of digital divide strategies. Availability of digital resources received the highest rating, emphasizing the importance of infrastructure in digital learning (Van Deursen, 2022). Accessibility and integration were also rated highly, reinforcing the need for inclusive and effective use of technology (Asadullah & Bhattacharjee, 2022). Capacity building and digital literacy further support effective teaching practices and learner engagement (Apriyanto et al., 2024; Zulaikha et al., 2024). Additionally, access to digital tools enhances instructional planning and professional development (UNESCO, 2022; 2023). These findings imply that teachers view digital initiatives as comprehensive and well-implemented, highlighting the importance of continuous access, training, and institutional support in sustaining digital learning environments.

Table 4

Extent of Strategies Employed by Public Elementary Schools to Improve the Digital Divide as Evaluated by PTA Representatives (N=50)

	Mean	Std. Deviation	Interpretation
A. Availability of digital resources	4.722	.308	Very Great Extent
B. Accessibility for all learners	4.690	.196	Very Great Extent
C. Integration in classroom instruction	4.649	.296	Very Great Extent
D. Capacity building and digital literacy	4.670	.140	Very Great Extent
E. School-community partnerships	4.498	.198	Very Great Extent
F. Sustainability of initiatives	4.558	.291	Very Great Extent

Note. The scale used in interpreting the extent of strategies was as follows: 4.21–5.00 = Very Great Extent; 3.41–4.20 = Great Extent; 2.61–3.40 = Moderate Extent; 1.81–2.60 = Low Extent; and 1.00–1.80 = Very Low Extent.

All indicators were rated to a Very Great Extent (M = 4.498–4.722), indicating strong stakeholder recognition of school efforts. Availability of resources received the highest rating, supporting its role in enabling digital participation (Lee & Ullah, 2024). Accessibility and digital literacy were also highly rated, emphasizing equitable access and skill development (Asadullah & Bhattacharjee, 2022; Zulaikha et al., 2024). Integration and sustainability further reflect active implementation, though sustainability requires continued support (Apriyanto et al., 2024; Astari & Yulianto, 2025). Although partnerships had the lowest mean, they remain strong, reinforcing their role in enhancing access (Yousofi et al., 2025). These findings imply that stakeholders perceive schools as effectively addressing the digital divide, while continued collaboration and support are needed for sustainability.

Table 5

Extent of Strategies Employed by Public Elementary Schools to Improve the Digital Divide as Evaluated by Learners When Grouped According to School Location and School Type

		Rural/ Non-Central (n=802)	Urban/ Central (n=214)
Availability of digital resources	Mean	4.629	4.624
	Std. Deviation	.187	.188
	Interpretation	Very Great Extent	Very Great Extent
Accessibility for all learners	Mean	4.613	4.630
	Std. Deviation	.204	.222
	Interpretation	Very Great Extent	Very Great Extent
Integration in classroom Instruction	Mean	4.579	4.597
	Std. Deviation	.204	.229

	Interpretation	Very Great Extent	Very Great Extent
Capacity building and digital literacy	Mean	4.639	4.665
	Std. Deviation	.193	.251
	Interpretation	Very Great Extent	Very Great Extent
School-community partnerships	Mean	4.735	4.704
	Std. Deviation	.196	.221
	Interpretation	Very Great Extent	Very Great Extent
Sustainability of initiatives	Mean	4.519	4.404
	Std. Deviation	.199	.156
	Interpretation	Very Great Extent	Very Great Extent

Note. The scale used in interpreting the extent of strategies was as follows: 4.21–5.00 = Very Great Extent; 3.41–4.20 = Great Extent; 2.61–3.40 = Moderate Extent; 1.81–2.60 = Low Extent; and 1.00–1.80 = Very Low Extent.

All indicators were rated to a Very Great Extent across both groups, indicating consistent implementation regardless of location. Similar ratings in resource availability and accessibility suggest equitable distribution of digital resources (Castaño-Muñoz et al., 2025; Thapaliya & Panta, 2025). Slightly higher ratings in urban schools for integration and digital literacy may reflect greater exposure to technology (Navas-Bonilla et al., 2025). Meanwhile, strong partnership ratings highlight the importance of collaboration in both contexts (Yousofi et al., 2025). These results imply that digital divide strategies are broadly effective across locations, though contextual differences may influence implementation intensity.

Table 6

Extent of Strategies Employed by Public Elementary Schools to Improve the Digital Divide as Evaluated by Learners When Grouped According to School Size

		Large (n=448)	**Medium (n=414)**	**Small (n=154)**
Availability of digital resources	Mean	4.633	4.610	4.662
	Std. Deviation	.189	.189	.171
	Interpretation	Very Great Extent	Very Great Extent	Very Great Extent
Accessibility for all learners	Mean	4.616	4.591	4.691
	Std. Deviation	.210	.206	.187
	Interpretation	Very Great Extent	Very Great Extent	Very Great Extent
Integration in classroom Instruction	Mean	4.570	4.568	4.660
	Std. Deviation	.217	.208	.174
	Interpretation	Very Great Extent	Very Great Extent	Very Great Extent
Capacity building and digital literacy	Mean	4.629	4.642	4.697
	Std. Deviation	.225	.199	.158
	Interpretation	Very Great Extent	Very Great Extent	Very Great Extent
School-community partnerships	Mean	4.698	4.748	4.765
	Std. Deviation	.213	.196	.173
	Interpretation	Very Great Extent	Very Great Extent	Very Great Extent
Sustainability of initiatives	Mean	4.481	4.491	4.548
	Std. Deviation	.186	.196	.220
	Interpretation	Very Great Extent	Very Great Extent	Very Great Extent

Note. The scale used in interpreting the extent of strategies was as follows: 4.21–5.00 = Very Great Extent; 3.41–4.20 = Great Extent; 2.61–3.40 = Moderate Extent; 1.81–2.60 = Low Extent; and 1.00–1.80 = Very Low Extent.

All indicators were rated to a Very Great Extent across school sizes, indicating consistent implementation. Small schools generally reported slightly higher ratings, particularly in access and digital literacy, possibly due to more efficient resource distribution (Van Deursen & Van Dijk, 2022). High ratings in partnerships further highlight stakeholder collaboration (Yousofi

et al., 2025), while strong digital literacy supports effective technology use (Zulaikha et al., 2024). These findings imply that while all schools perform well, smaller school contexts may facilitate more effective delivery of digital initiatives.

Table 7

Extent of Strategies Employed by Public Elementary Schools to Improve the Digital Divide as Evaluated by Teachers When Grouped According to School Location and School Type

		Rural/ Non-Central (n=119)	Urban/ Central (n=37)
Availability of digital resources	Mean	4.761	4.732
	Std. Deviation	.247	.222
	Interpretation	Very Great Extent	Very Great Extent
Accessibility for all learners	Mean	4.623	4.614
	Std. Deviation	.252	.236
	Interpretation	Very Great Extent	Very Great Extent
Integration in classroom Instruction	Mean	4.534	4.570
	Std. Deviation	.250	.282
	Interpretation	Very Great Extent	Very Great Extent
Capacity building and digital literacy	Mean	4.538	4.505
	Std. Deviation	.211	.227
	Interpretation	Very Great Extent	Very Great Extent
School-community partnerships	Mean	4.539	4.511
	Std. Deviation	.170	.208
	Interpretation	Very Great Extent	Very Great Extent
Sustainability of initiatives	Mean	4.529	4.492
	Std. Deviation	.151	.152
	Interpretation	Very Great Extent	Very Great Extent

Note. The scale used in interpreting the extent of strategies was as follows: 4.21–5.00 = Very Great Extent; 3.41–4.20 = Great Extent; 2.61–3.40 = Moderate Extent; 1.81–2.60 = Low Extent; and 1.00–1.80 = Very Low Extent.

All indicators were rated to a Very Great Extent, showing consistent implementation across locations. Slightly higher ratings in rural schools for resources and capacity building may reflect targeted policy interventions (OECD, 2023), while higher integration in urban schools may be linked to greater exposure (Navas-Bonilla et al., 2025). Strong ratings in partnerships further emphasize stakeholder engagement (Yousofi et al., 2025). These results imply that digital initiatives are broadly standardized, with minor contextual variations.

Table 8

Extent of Strategies Employed by Public Elementary Schools to Improve the Digital Divide as Evaluated by Teachers When Grouped According to School Size

		Large (n=33)	Medium (n=98)	Small (n=25)
Availability of digital resources	Mean	4.730	4.757	4.772
	Std. Deviation	.219	.237	.289
	Interpretation	Very Great Extent	Very Great Extent	Very Great Extent
Accessibility for all learners	Mean	4.612	4.611	4.668
	Std. Deviation	.233	.233	.317
	Interpretation	Very Great Extent	Very Great Extent	Very Great Extent
Integration in classroom Instruction	Mean	4.597	4.506	4.612
	Std. Deviation	.282	.242	.264

	Interpretation	Very Great Extent	Very Great Extent	Very Great Extent
Capacity building and digital literacy	Mean	4.494	4.523	4.604
	Std. Deviation	.225	.218	.174
	Interpretation	Very Great Extent	Very Great Extent	Very Great Extent
School-community partnerships	Mean	4.506	4.521	4.612
	Std. Deviation	.211	.171	.148
	Interpretation	Very Great Extent	Very Great Extent	Very Great Extent
Sustainability of initiatives	Mean	4.491	4.516	4.572
	Std. Deviation	.157	.144	.167
	Interpretation	Very Great Extent	Very Great Extent	Very Great Extent

Note. The scale used in interpreting the extent of strategies was as follows: 4.21–5.00 = Very Great Extent; 3.41–4.20 = Great Extent; 2.61–3.40 = Moderate Extent; 1.81–2.60 = Low Extent; and 1.00–1.80 = Very Low Extent.

All indicators were rated to a Very Great Extent, with small schools showing slightly higher ratings. This may be due to more flexible structures and efficient implementation (Van Deursen & Van Dijk, 2022). High ratings in digital literacy reinforce the importance of teacher training (Zulaikha et al., 2024). These findings imply that while implementation is consistent, school size may influence effectiveness at a practical level.

Table 9

Extent of Strategies Employed by Public Elementary Schools to Improve the Digital Divide as Evaluated by PTA Representatives When Grouped According to School Location and School Type

		Rural/ Non-Central (n=46)	Urban/ Central (n=6)
Availability of digital resources	Mean	4.712	4.844
	Std. Deviation	.315	.187
	Interpretation	Very Great Extent	Very Great Extent
Accessibility for all learners	Mean	4.685	4.750
	Std. Deviation	.190	.289
	Interpretation	Very Great Extent	Very Great Extent
Integration in classroom Instruction	Mean	4.640	4.750
	Std. Deviation	.298	.295
	Interpretation	Very Great Extent	Very Great Extent
Capacity building and digital literacy	Mean	4.668	4.688
	Std. Deviation	.132	.239
	Interpretation	Very Great Extent	Very Great Extent
School-community partnerships	Mean	4.495	4.531
	Std. Deviation	.201	.188
	Interpretation	Very Great Extent	Very Great Extent
Sustainability of initiatives	Mean	4.535	4.813
	Std. Deviation	.292	.125
	Interpretation	Very Great Extent	Very Great Extent

Note. The scale used in interpreting the extent of strategies was as follows: 4.21–5.00 = Very Great Extent; 3.41–4.20 = Great Extent; 2.61–3.40 = Moderate Extent; 1.81–2.60 = Low Extent; and 1.00–1.80 = Very Low Extent.

All indicators were rated to a Very Great Extent, with slightly higher ratings in urban schools. This may be attributed to stronger infrastructure and partnerships (Ramírez-Correa et al., 2025). Despite this, both groups show strong implementation, implying that digital initiatives are effective across contexts, with urban areas having slight advantages.

Table 10

Extent of Strategies Employed by Public Elementary Schools to Improve the Digital Divide as Evaluated by PTA Representatives When Grouped According to School Size

		Large (n=4)	Medium (n=38)	Small (n=8)
Availability of digital resources	Mean	4.906	4.697	4.750
	Std. Deviation	.188	.313	.327
	Interpretation	Very Great Extent	Very Great Extent	Very Great Extent
Accessibility for all learners	Mean	4.875	4.663	4.725
	Std. Deviation	.250	.176	.231
	Interpretation	Very Great Extent	Very Great Extent	Very Great Extent
Integration in classroom Instruction	Mean	4.893	4.617	4.679
	Std. Deviation	.214	.299	.283
	Interpretation	Very Great Extent	Very Great Extent	Very Great Extent
Capacity building and digital literacy	Mean	4.750	4.655	4.703
	Std. Deviation	.250	.135	.093
	Interpretation	Very Great Extent	Very Great Extent	Very Great Extent
School-community partnerships	Mean	4.625	4.474	4.547
	Std. Deviation	.000	.218	.093
	Interpretation	Very Great Extent	Very Great Extent	Very Great Extent
Sustainability of initiatives	Mean	4.875	4.503	4.656
	Std. Deviation	.000	.291	.248
	Interpretation	Very Great Extent	Very Great Extent	Very Great Extent

Note. The scale used in interpreting the extent of strategies was as follows: 4.21–5.00 = Very Great Extent; 3.41–4.20 = Great Extent; 2.61–3.40 = Moderate Extent; 1.81–2.60 = Low Extent; and 1.00–1.80 = Very Low Extent.

All indicators were rated to a Very Great Extent, with large schools showing higher means. This may reflect greater access to resources and infrastructure (Castaño-Muñoz et al., 2025). However, the small sample size suggests caution in interpretation. Overall, the findings imply consistent implementation, with resource availability influencing perceptions.

Table 11

Independent Samples t-Test on the Extent of Strategies Employed by Public Elementary Schools to Improve the Digital Divide as Evaluated by Learners When Grouped According to School Location and School Type

	T	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Interpretation
Availability of digital resources	.380	1014	.704	.00547	.01440	Not Significant
Accessibility for all learners	-1.074	1014	.283	-.01716	.01597	Not Significant
Integration in classroom instruction	-1.098	1014	.272	-.01771	.01612	Not Significant
Capacity building and digital literacy	-1.624	1014	.105	-.02580	.01589	Not Significant
School-community partnerships	2.001	1014	.046	.03108	.01553	Not Significant
Sustainability of initiatives	7.865	1014	.000	.11545	.01468	Significant

Note. The significance level for all statistical tests was set at $\alpha = 0.05$. p-values less than .05 indicate a statistically significant difference, whereas p-values equal to or greater than .05 indicate no significant difference.

No significant differences were found in most indicators, indicating consistent implementation across locations (OECD, 2023). However, sustainability showed a significant difference, suggesting variation in long-term support (Ramírez-Correa et al., 2025). This implies that while access and implementation are uniform, sustainability remains context-dependent.

Table 12

Independent Samples t-Test on the Extent of Strategies Employed by Public Elementary Schools to Improve the Digital Divide as Evaluated by Teachers When Grouped According to School Location and School Type

	T	df	Sig.* (2-tailed)	Mean Difference	Std. Error Difference	Interpretation
Availability of digital resources	.617	154	.538	.02807	.04552	Not Significant
Accessibility for all learners	.196	154	.845	.00918	.04673	Not Significant
Integration in classroom instruction	-.756	154	.451	-.03666	.04850	Not Significant
Capacity building and digital literacy	.802	154	.424	.03241	.04041	Not Significant
School-community partnerships	.849	154	.397	.02868	.03378	Not Significant
Sustainability of initiatives	1.287	154	.200	.03668	.02850	Not Significant

Note. The significance level for all statistical tests was set at $\alpha = 0.05$. p-values less than .05 indicate a statistically significant difference, whereas p-values equal to or greater than .05 indicate no significant difference.

No significant differences were found, indicating consistent teacher perceptions across locations. This supports the role of standardized policies and training (Navas-Bonilla et al., 2025). The findings imply that digital initiatives are uniformly implemented regardless of location.

Table 13

Independent Samples t-Test on the Extent of Strategies Employed by Public Elementary Schools to Improve the Digital Divide as Evaluated by PTA Representatives When Grouped According to School Location and School Type

	T	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Interpretation
Availability of digital resources	-.819	48	.417	-.13179	.16085	Not Significant
Accessibility for all learners	-.634	48	.529	-.06522	.10287	Not Significant
Integration in classroom instruction	-.711	48	.481	-.11025	.15511	Not Significant
Capacity building and digital literacy	-.258	48	.797	-.01902	.07372	Not Significant
School-community partnerships	-.352	48	.726	-.03668	.10417	Not Significant

Note. The significance level for all statistical tests was set at $\alpha = 0.05$. p-values less than .05 indicate a statistically significant difference, whereas p-values equal to or greater than .05 indicate no significant difference.

No significant differences were observed, suggesting consistent stakeholder perceptions. This may reflect effective communication and shared understanding (Yousofi et al., 2025). The findings imply strong alignment between schools and communities.

CONCLUSIONS

The findings of the study reveal that public elementary schools in the Division of Cadiz City are implementing strategies to address the digital divide to a very great extent across key areas such as resource availability, accessibility, technology integration,

capacity building, school-community partnerships, and sustainability. This reflects a strong commitment to promoting digital inclusion in education. However, variations observed when schools are grouped according to demographic profiles suggest that contextual factors influence the implementation and sustainability of these initiatives. While stakeholders share similar perceptions, continuous support-particularly in sustaining programs and enhancing teacher capacity remains essential to ensure long-term effectiveness.

Moreover, the findings imply that public elementary schools are effectively implementing strategies to address the digital divide, particularly in terms of access, technology integration, and stakeholder collaboration. However, the relatively lower emphasis on sustainability highlights the need for stronger long-term planning, continuous funding, and consistent support to maintain these initiatives.

The results also underscore the importance of enhancing teachers' digital competencies through continuous professional development, as well as strengthening school-community partnerships to expand access to resources. Moreover, the presence of variations across school profiles suggests the need for targeted support to ensure equitable implementation of digital strategies. Overall, addressing the digital divide requires sustained, collaborative, and context-responsive efforts.

RECOMMENDATIONS

Based on the findings, it is recommended that schools strengthen the sustainability of digital initiatives through continuous funding, planning, and monitoring. Professional development programs should be enhanced to improve teachers' digital competencies and instructional practices. Schools should also expand partnerships with stakeholders to support digital programs, while policymakers may provide targeted assistance to schools with limited resources. Future studies may further explore the long-term impact of digital strategies and other factors affecting their effectiveness.

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