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Implementation of the DepEd Computerization Program in Integrated Schools of Kabugao District I: Basis for ICT Infrastructure Enhancement

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Abstract

ICT integration has enhanced instructional delivery, improved student engagement, strengthened assessment practices, and streamlined administrative functions. This study assessed the implementation of the DepEd Computerization Program (DCP) in selected integrated schools of Kabugao District I, using quantitative analysis. Thirty-three respondents, composed of teachers, administrators, and non-teaching staff, participated through total enumeration sampling. Findings revealed that the respondents were predominantly young, early-career female teachers, reflecting national workforce trends. ICT resources provided under the DCP were rated adequate to sufficient, particularly in terms of computers, audio-visual equipment, training, and technical support, while internet connectivity was identified as a critical limitation due to geographic isolation. ICT utilization was generally high, especially in administrative functions and compliance with policies, though classroom integration and teacher support were less consistent. Overall, the results highlight that while the DCP has successfully delivered hardware and institutional support, its sustainability and effectiveness are constrained by connectivity issues and the need for stronger instructional capacity-building. Recommendations include strengthening internet infrastructure, enhancing teacher ICT training, institutionalizing technical support systems, promoting balanced ICT use in teaching and learning, and conducting periodic monitoring and evaluation to refine program implementation.

Keywords: DepEd Computerization Program (DCP); ICT Integration; Internet Connectivity Challenges; Teacher Capacity-Building

1. Introduction

The integration of information and communication technology (ICT) in education has become a defining feature of modern schooling systems across the world. In an era characterized by rapid technological innovation, educational institutions are increasingly expected to prepare learners not merely with foundational academic knowledge, but with the digital competencies necessary to navigate and contribute meaningfully to a knowledge-driven global society. Scholars and international organizations have consistently affirmed that ICT integration in education holds the potential to democratize access to quality learning, foster learner-centered pedagogies, and improve educational outcomes at scale. As digital transformation accelerates across all sectors of society, the capacity of educational systems to harness technology effectively has emerged as both a national development priority and a global imperative.

Globally, governments have invested heavily in technology-enhanced education through large-scale national programs designed to equip schools with modern ICT infrastructure. Studies conducted across diverse international contexts, including those in the United States, South Korea, Australia, and various European nations, have documented the positive contributions of well-implemented ICT programs to instructional quality, student motivation, and teacher effectiveness [1]. In developing regions, similar efforts have been undertaken with the recognition that bridging the digital divide is fundamental to achieving educational equity and sustainable development goals [2]. The integration of

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computers, internet connectivity, and multimedia tools into classroom instruction has been associated with higher-order thinking, increased learner engagement, and more personalized approaches to teaching and assessment [3]. Nevertheless, research consistently cautions that technology alone is insufficient; effective ICT integration requires robust infrastructure, continuous teacher professional development, strong institutional support, and coherent policy frameworks to translate digital access into meaningful learning outcomes [4].

In Southeast Asia, nations have pursued ICT-in-education programs with varying degrees of success, shaped by the interplay of economic capacity, governance structures, and existing educational infrastructure. Countries such as Singapore, Malaysia, and Thailand have made significant strides in embedding technology across their educational systems through sustained government investment and comprehensive implementation frameworks [5]. These experiences highlight that successful ICT integration is not incidental but is the product of deliberate, context-sensitive planning and sustained institutional commitment [6]. Conversely, nations with more limited resources face persistent structural barriers, including unreliable power supply, inadequate internet connectivity, shortage of trained personnel, and difficulties in sustaining equipment maintenance, all of which constrain the full realization of ICT's educational potential [7]. These regional experiences provide important comparative lessons for countries such as the Philippines, where ICT-in-education initiatives have been pursued amidst complex socioeconomic and geographic realities [8].

In the Philippines, the national government's commitment to technology-enhanced education is most prominently embodied in the DepEd Computerization Program (DCP), institutionalized under the Department of Education. Launched with the objective of equipping public elementary and secondary schools with ICT packages, including desktop computers, laptops, projectors, smart televisions, and internet connectivity solutions, the DCP represents one of the most expansive technology-in-education investments in the country's history [9]. The program is anchored on the policy imperatives of improving the quality of basic education, developing the digital literacy of both teachers and students, supporting data-driven school management, and narrowing the digital divide between urban and rural schools [10]. The DCP aligns with the broader educational agenda articulated in the Enhanced Basic Education Act of 2013 and is further reinforced by DepEd's own ICT for Education (ICT4E) strategic framework, which envisions technology as a transformative tool for pedagogical innovation and educational access [11].

Despite the breadth of the DCP's coverage and the scale of government investment, empirical studies conducted across various Philippine contexts have identified persistent and recurring implementation challenges. Research findings point to significant gaps between policy intent and actual school-level practice, with many public schools reporting underutilization of ICT equipment due to teachers limited digital competencies, inadequate training programs, and insufficient technical support [12]. Infrastructure-related concerns are equally prevalent, particularly in schools located in rural and geographically isolated areas where unstable electrical supply and poor internet connectivity severely constrain the operational functionality of ICT resources [13]. Studies further document problems with equipment maintenance, including the absence of systematic repair mechanisms, delayed replacement of damaged units, and unclear delineation of responsibility for ICT asset management at the school level [14]. These findings collectively suggest that the DCP, while commendable in scope and vision, has yet to achieve its full transformative potential across all school contexts in the country [15].

The province of Apayao, situated in the Cordillera Administrative Region of northern Luzon, presents a particularly compelling and underexplored setting for examining the ground-level realities of DCP implementation. As one of the country's geographically isolated and underdeveloped provinces, Apayao is characterized by mountainous terrain, limited road infrastructure, sparse population distribution, and constrained access to public services including education and technology support [16]. Schools operating in this environment, particularly in the municipality of Kabugao, the provincial capital, face compounding disadvantages that significantly affect their capacity to implement and sustain ICT programs effectively. Unstable power supply limited or absent internet connectivity, geographic distance from technical service providers, and the scarcity of digitally competent teaching personnel represent formidable structural barriers to meaningful ICT integration [17]. These local realities render the DCP's aspirations considerably more difficult to achieve, and yet they remain insufficiently documented and addressed in the existing research literature [18].

Within Kabugao District I specifically, the presence of integrated schools, institutions that jointly administer both elementary and secondary education under a single organizational structure, introduces additional layers of complexity to DCP implementation. Integrated schools operate with shared human resources, consolidated facilities, and unified budgets that must simultaneously address the instructional needs of learners across widely varying developmental stages [19]. The management of ICT resources within such an institutional structure demands clear coordination mechanisms, defined roles and responsibilities, and efficient allocation strategies that may differ substantially from those applicable to standalone elementary or secondary schools [20]. Research examining ICT implementation in

integrated school settings remains scarce both in the Philippine literature and internationally, representing a meaningful gap in the scholarly understanding of how technology programs function within organizationally complex school environments [21].

A critical review of the existing literature further reveals that prior studies on the DCP and related ICT-in-education programs in the Philippines have predominantly focused on teacher attitudes, self-reported readiness, and broad implementation assessments at regional or national levels [22]. Relatively few studies have undertaken systematic, school-level evaluations that examine the actual operational status of ICT infrastructure, the frequency and quality of technology use in instruction, the adequacy of maintenance and technical support systems, and the sustainability mechanisms that determine whether ICT investments yield durable educational benefits [23]. This emphasis on access over utilization, and on perception over practice, has left significant empirical voids that limit the capacity of educational authorities to design evidence-based interventions suited to the specific needs of schools in remote and resource-constrained contexts [24].

It is against this backdrop of global imperatives, national policy commitments, regional challenges, and localized research gaps that the present study is situated. This investigation sought to conduct a comprehensive assessment of the implementation of the DepEd Computerization Program in the integrated schools of Kabugao District I, with the aim of generating empirical evidence that can serve as a basis for targeted ICT infrastructure enhancement. By examining the operational status of ICT equipment, the patterns of technology utilization in instruction, the effectiveness of technical support and maintenance systems, and the sustainability of ICT resources within the unique institutional and geographic context of integrated schools in Kabugao, this study aimed to produce data-driven insights capable of informing local decision-making, guiding district-level planning, and contributing to the broader discourse on effective ICT integration in Philippine public education. The findings are intended to serve as a foundational reference for policymakers, school administrators, and program implementers seeking to strengthen the quality and sustainability of ICT integration in underserved educational communities.

2. Methodology

2.1. Research Design

This study employed quantitative-qualitative research design, using an adapted survey questionnaire. The quantitative component utilized structured questionnaires administered to teachers, school administrators, and IT personnel, with data analyzed through frequency counts, percentages, means, and standard deviations to identify patterns and gaps. The qualitative component involved interviews and open-ended survey questions, allowing participants to share experiences, challenges, and suggestions, which were analyzed thematically to complement the quantitative findings. By integrating both sets of data, the study provided a holistic evaluation of the DCP, ensuring that measurable trends and contextual insights were considered in generating recommendations for strengthening ICT infrastructure and sustaining effective program implementation.

2.2. Locale of the Study

The study was conducted in selected integrated schools in Kabugao District I, namely Musimut Integrated School and Dagara Integrated School, located in the Province of Apayao.

2.3. Respondents of the Study

The respondents of the study included the school heads, ICT coordinators, and teachers from the selected integrated schools in Kabugao District I, namely Dagara Integrated School and Musimut Integrated School. A total enumeration sampling technique was employed, wherein all eligible personnel directly involved in the implementation of the DepEd Computerization Program (DCP) were included in the study. The total number of respondents was thirty-three (33), consisting of fifteen (15) from Dagara Integrated School and eighteen (18) from Musimut Integrated School. The relatively small number of respondents was due to the limited total population of teachers and school personnel in these integrated schools. Since the study covered all available and qualified participants, total enumeration ensured comprehensive data collection and eliminated sampling bias within the selected schools.

2.4. Statistical Analysis

The data gathered were analyzed using several statistical tools. Frequency counts and percentages were used to describe the respondents' profile. Weighted means were applied to determine the level of implementation of the DepEd Computerization Program (DCP). Pearson Product-Moment Correlation Coefficient (r) was employed to test the

significant relationship between respondents' profile variables and the dimensions of DCP implementation. Finally, responses from open-ended questions and interview data were analyzed using thematic analysis.

3. Results and discussion

3.1. Profile of the Respondents

Table 1 Distribution of Respondents by Age

Category	Frequency	Percentage (%)
20-25	1	3.0
26-30	14	42.4
31-35	5	15.2
36-40	4	12.1
41-45	5	15.2
46-50	1	3.0
51 and above	3	9.1

Table 1 presents the demographic profile of the 33 respondents from Dagara Integrated School (DIS) and Musimut Integrated School (MIS), composed of teachers, school administrators, administrative officers, and non-teaching staff. As shown in Table 1, the largest age cohort among respondents is 26–30 years, comprising 14 or 42.4% of the total sample. This is followed by those aged 31–35 years (5 or 15.2%) and 41–45 years (5 or 15.2%). The mean age of the respondents is 35.0 years (SD = 8.0), indicating a predominantly young to middle-aged workforce. The concentration of younger educators (26–35 years) suggests that these schools are staffed by relatively new and early-career teachers, who may be more receptive to technology adoption but may also require structured ICT capacity-building programs to maximize the potential of the DCP.

Table 2 Distribution of Respondents by Sex

Category	Frequency	Percentage (%)
Female	24	72.7
Male	9	27.3

Table 2 reveals a data more on female workforce, with 24 female respondents (72.7%) compared to 9 males (27.3%). This gender distribution mirrors the national trend in Philippine basic education where female teachers comprise most of the teaching force, particularly in elementary and integrated schools (DepEd, 2023). The gender composition may have implications on technology use patterns, as research indicates that female educators often show different technology integration preferences compared to their male counterparts.

Table 3 Distribution of Respondents by Position/Designation

Category	Frequency	Percentage (%)
Teacher (T-I to T-VI)	25	75.8
Administrative Officer	3	9.1
Non-Teaching Staff (PSB/LSB)	3	9.1
School Head / Head Teacher	2	6.1

Table 3 shows that most respondents are classroom teachers (T-I to T-VI), comprising 25 or 75.8% of the total. Administrative Officers account for 3 (9.1%), non-teaching staff (PSB/LSB) for 3 (9.1%), and school heads or head teachers for 2 (6.1%). The predominance of classroom teachers is expected given the study's focus on integrated schools; however, the inclusion of non-teaching personnel and administrators provides a holistic perspective on DCP implementation across all levels of school operations.

Table 4 Distribution of Respondents by Number of Years in Service

Category	Frequency	Percentage (%)
1–5 years	14	42.4
6–10 years	13	39.4
11–15 years	2	6.1
16–20 years	2	6.1
21 years and above	2	6.1

Table 4 indicates that most respondents are relatively early in their careers, with 14 (42.4%) having served for 1–5 years and 13 (39.4%) serving for 6–10 years. Combined, these two brackets account for 81.8% of the respondents, reflecting a young service profile. The mean years in service is 7.7 (SD = 6.2). A smaller proportion (6.1% each) represent the 11–15, 16–20, and 21-year-and-above brackets. This profile suggests that a significant majority of the school personnel are in the formative stages of their professional development, making ICT training and mentoring particularly critical for sustained DCP implementation.

Table 5 Distribution of Respondents by School Level

Category	Frequency	Percentage (%)
Integrated – Elementary	13	39.4
Integrated – High School	17	51.5
Integrated (Both Levels)	3	9.1

Table 5 shows that 17 respondents (51.5%) are from the Integrated High School level, 13 (39.4%) from the Integrated Elementary level, and 3 (9.1%) from schools catering to both levels. This distribution reflects the integrated nature of the sampled schools in Kabugao District I, where a single school campus serves both elementary and junior high school populations, which is a common structure in geographically isolated and disadvantaged areas (GIDAs) in the Cordillera Administrative Region.

3.2. Level of Implementation of the DepEd Computerization Program

3.2.1. Availability of ICT Equipment and Resources

Table 6 Level of Availability of ICT Equipment and Resources

Indicators	Mean	SD	Description
1. Computers provided by the DCP	4.09	0.29	Sufficient
2. Internet and network connectivity	2.48	0.87	Limited
3. Audio-visual equipment (projectors, speakers)	3.64	0.60	Sufficient
4. Teacher training and capacity-building programs	3.52	0.62	Sufficient
5. Technical support and maintenance services	3.70	0.47	Sufficient
Overall Weighted Mean	3.49	0.57	Adequate

Table 6 presents the mean ratings for the availability of ICT equipment and resources. The overall weighted mean of 3.49 (SD = 0.57), described as Adequate, suggests that while the DCP has delivered tangible resources to the schools, availability levels remain below the Sufficient threshold. Specifically, computers provided by the DCP received the highest mean rating (M = 4.09, SD = 0.29), interpreted as Sufficient, indicating that the physical hardware provision was effectively carried out. Audio-visual equipment (M = 3.64), technical support (M = 3.70), and ICT training programs (M = 3.52) likewise fall within the Sufficient range, suggesting adequate institutional support structures. The most critical gap is observed in internet and network connectivity, which recorded the lowest mean of 2.48 (SD = 0.87), interpreted as Limited. This finding is consistent with the geographical isolation of Kabugao, where power supply instability, primarily reliance on solar panels, severely constrains internet infrastructure. The absence of reliable connectivity undermines the broader utilization and sustainability of the DCP, as digitally enriched instruction requires consistent online access.

3.2.2. Utilization of ICT (Processes)

Table 7 Level of ICT Utilization in School Operations

Indicators	Mean	SD	Description
1. ICT is used in classroom teaching and learning	3.94	0.43	Often
2. ICT is used for school administrative and management tasks	4.94	0.25	Always
3. Teachers receive guidance and support for ICT integration	3.94	0.56	Often
4. Equipment is regularly maintained and functional	4.33	0.48	Often
5. Policies and guidelines for ICT use are consistently followed	4.97	0.17	Always
Overall Weighted Mean	4.42	0.38	Often

Table 7 reveals that ICT utilization across school processes is generally high, with an overall weighted mean of 4.42 (SD = 0.38), described as Often. Two indicators reached the Always level: ICT use for administrative and management tasks (M = 4.94) and compliance with ICT policies and guidelines (M = 4.97). This finding suggests that administrative functions have been more effectively digitized than pedagogical applications.

ICT use in classroom teaching and learning (M = 3.94) and teacher support for ICT integration (M = 3.94) are rated Often, while equipment maintenance (M = 4.33) also falls in the same category. The slightly lower scores for instructional use and teacher support indicate that while the infrastructure exists, pedagogical integration requires further reinforcement through sustained professional development and on-site technical assistance.

3.2.3. Outcomes of DCP Implementation

Table 8 Perceived Outcomes of DCP Implementation

Indicators	Mean	SD	Description
1. The DCP has improved the overall ICT infrastructure	3.91	0.46	Agree
2. Teachers' digital literacy and competence have increased	4.06	0.43	Agree
3. Students have greater access to and use of ICT resources	3.88	0.33	Agree
4. Classroom instruction has become more interactive and engaging	4.24	0.44	Agree
5. School management and administrative efficiency have improved	4.91	0.29	Strongly Agree
Overall Weighted Mean	4.20	0.39	Agree

Table 8 presents the perceived outcomes of the DCP. The overall weighted mean of 4.20 (SD = 0.39), interpreted as Agree, indicates that respondents generally concur that the DCP has produced positive results in their respective schools. The highest-rated outcome is improved school management and administrative efficiency (M = 4.91, SD = 0.29), approaching the Strongly Agree level corroborating the utilization data which also showed near-universal adoption of

ICT for administrative tasks. Classroom instruction becoming more interactive (M = 4.24) and increased teacher digital competence (M = 4.06) are likewise affirmed at the Agree level. The lowest-rated outcomes are improved ICT infrastructure (M = 3.91) and student access to ICT resources (M = 3.88), both still within the Agree range but reflecting the infrastructure limitations, particularly internet connectivity and power supply that constrain the full realization of DCP benefits for learners.

3.3. Relationship Between Respondents' Profile and the Level of DCP Implementation

Table 9 Correlation Analysis between Age and Level of DCP Implementation

Dimension	ρ	p-value	Decision (α = .05)
ICT Resources	-0.037	0.840	Fail to Reject H_0
ICT Utilization	-0.051	0.779	Fail to Reject H_0
Outcomes	0.196	0.274	Fail to Reject H_0
Overall Implementation	0.022	0.906	Fail to Reject H_0

Table 9 shows that age has no statistically significant relationship with any dimension of DCP implementation (all p > .05). The correlation coefficients are near zero and in varying directions (ρ ranging from -0.051 to 0.196), indicating no trend between a respondent's age and their perceived level of DCP implementation.

Table 10 Correlation Analysis on Years between Service and Level of DCP Implementation

Dimension	ρ	p-value	Decision (α = .05)
ICT Resources	-0.128	0.479	Fail to Reject H_0
ICT Utilization	0.056	0.756	Fail to Reject H_0
Outcomes	0.131	0.469	Fail to Reject H_0
Overall Implementation	0.014	0.938	Fail to Reject H_0

Similarly, Table 10 reveals that years in service is not significantly correlated with DCP implementation across all dimensions (ρ ranging from -0.128 to 0.131; all p > .05). This finding suggests that whether a respondent is a newly hired employee or a seasoned professional, their perception of DCP implementation remains comparable.

Challenges Encountered in the Implementation of the DCP

3.4. Challenges and Suggestions

Table 11 Thematic Summary of Challenges in DCP Implementation

Theme	Representative Responses	Freq.
1. Unreliable Power Supply	"Unstable electricity supply during rainy season because we are only using solar panels." | "Lack of electricity. We are only using solar panels and batteries."	20
2. Limited Internet Connectivity	"Limited internet connection due to unreliable power supply." | "Internet is not stable due to lack of electricity."	18
3. Inadequate Technical Support	"Sometimes some computers won't work properly due to malfunction, so we need experts from ICT to help us." | "Only AO can check them but not 100% technically skilled on IT."	5
4. Insufficient Teacher Training	"Insufficient teacher training. Teachers may not be equipped to integrate ICT into teaching effectively."	3

5. Equipment Obsolescence	"Outdated and incompatible equipment devices may become obsolete quickly or not meet current software requirements."	1

The most pervasive challenge, cited by approximately 20 of 33 respondents (60.6%), is unreliable power supply. The schools in Kabugao District I are located in geographically isolated and disadvantaged areas (GIDAs) that depend heavily on solar panels and batteries as their primary source of electricity. During the rainy season, insufficient solar energy generation results in power outages that disrupt computer use and jeopardize the functionality of DCP equipment. Closely linked to the power issue is limited internet connectivity, raised by approximately 18 respondents. Since internet access in these schools is primarily routed through satellite-based solutions (e.g., Starlink), their operation is contingent on the same solar energy supply. Power shortages, therefore, have a cascading effect that simultaneously disables both computing capacity and internet access. Other challenges include inadequate technical support (n = 5), where schools rely on Administrative Officers (AOs) who may lack the specialized ICT proficiency required for hardware and software troubleshooting; insufficient teacher training (n = 3), which limits pedagogical integration of DCP resources; and equipment obsolescence (n = 1), with concern that aging hardware may soon become incompatible with current software requirements.

3.5. Proposed Interventions to Strengthen the Implementation and Sustainability of the DCP

Table 12 Proposed Interventions for DCP Enhancement

Challenge	Proposed Intervention	Lead Agency	Priority
Unreliable Power Supply	Expand and upgrade solar power systems; install battery storage banks; procure backup generators for schools in GIDAs.	DepEd Division / LGU / DSWD	High
Limited Internet Connectivity	Request additional Starlink units per school; explore DepEd's Enhanced Internet Connectivity Program (EICP) for GIDA schools.	DepEd Central / Division ICT	High
Inadequate Technical Support	Establish a roving ICT technical team at the Division level to conduct regular maintenance visits; train AOs as on-site ICT coordinators.	DepEd Division / Schools Division Superintendent	High
Insufficient Teacher Training	Implement mandatory and continuous ICT integration training (LAC sessions, online courses via DepEd Commons); designate ICT champions per school.	School Heads / ICT Coordinators	Medium
Equipment Obsolescence	Institutionalize a phased equipment replacement plan aligned with DepEd procurement cycles; adopt offline-capable platforms for areas with intermittent connectivity.	DepEd Division / Finance	Medium

The highest-priority interventions center on addressing the twin infrastructural challenges of power supply and internet connectivity, which represent the foundational prerequisites for any meaningful DCP utilization. Without reliable electricity, even fully functional DCP hardware cannot be used; without internet access, many of the program's digital learning opportunities remain inaccessible. Respondents themselves articulated these needs clearly, with several suggestions: "Schools that were given DCP should also be given solar lights such as batteries, panels, and at least one more Starlink for reliable internet connectivity" and "Request to DepEd and LGU to provide and install more solar panels with battery storage to provide continuous electricity." These recommendations directly inform the proposed interventions above. Medium-priority interventions address human resource capacity: teacher training programs and the designation of school-level ICT champions would ensure that the hardware is pedagogically integrated rather than merely administratively deployed. Equipment replacement planning, while currently a low-frequency concern, should be built into long-term ICT sustainability frameworks to prevent the progressive obsolescence of DCP assets.

Collectively, these interventions are proposed as a comprehensive ICT Infrastructure Enhancement Plan for Kabugao District I, addressing immediate needs while building long-term systemic resilience for DCP sustainability in geographically challenged school communities.

4. Conclusion

In conclusion, the study demonstrated that while the DepEd Computerization Program (DCP) has positively impacted integrated schools in Kabugao District I by improving administrative efficiency, enhancing teacher digital competence, and making classroom instruction more interactive, its full potential remains constrained by persistent infrastructural and capacity-related challenges. The respondents, largely young and early-career teachers, confirmed adequate provision of computers, audio-visual equipment, training, and technical support, but highlighted unreliable power supply, limited internet connectivity, and insufficient teacher training as major barriers. Correlation analysis further showed that age and years in service had no significant influence on perceptions of DCP implementation, underscoring that these challenges cut across all personnel groups. Overall, the findings emphasize that while the DCP has laid a strong foundation for ICT integration, sustained improvements in infrastructure, technical support, and professional development are essential to ensure its long-term effectiveness and sustainability in geographically isolated and disadvantaged school communities.

Compliance with ethical standards

Acknowledgments

I acknowledge that I have not used ChatGPT or Copilot for refining some of the sections in the document.

Disclosure of conflict of interest

Author have declared that they have no known competing financial interests OR non-financial interests OR personal relationships that could have appeared to influence the work reported in this paper.

Statement of ethical approval

The study was conducted with approval and in accordance with the standards of the college. No ethical approval was required, as the research followed all applicable ethical guidelines, ensuring respect for the respondents' privacy and confidentiality.

Statement of informed consent

I affirm that the respondents voluntarily agreed to participate after being fully informed about the purpose, nature, and potential implications of the study. Their responses have been collected with utmost respect for their privacy and confidentiality, in accordance with ethical research guidelines.

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