

Readiness of teachers to support pupils with learning disabilities through ICT-Enabled Instruction

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Abstract

This study assessed the readiness of teachers to support pupils with learning disabilities through ICT-enabled instruction in seven selected public elementary schools in Kabugao District I, Division of Apayao, for School Year 2025–2026. Grounded on the principles of Inclusive Education and the Technological Pedagogical Content Knowledge (TPACK) framework, the study employed a descriptive survey design involving 40 public elementary school teachers through total enumeration. Data were gathered using a structured questionnaire covering teachers' demographic profile, level of readiness, and perceived challenges in ICT-enabled inclusive instruction. Statistical tools including frequency, percentage, weighted mean, ANOVA, and T-test were used for quantitative data, while thematic analysis was applied to qualitative responses on perceived challenges. Findings revealed that the respondents are predominantly female, mid-career teachers aged 31 to 40, with 11 to 15 years of teaching experience. Most teachers have access only to basic ICT tools such as smartphones and laptops, while advanced and assistive technologies remain largely unavailable. The overall level of teacher readiness was found to be moderately ready ($M = 3.05$), indicating basic competence and willingness to integrate ICT but limited proficiency in assistive technologies and learning disability identification. Age was the only profile variable found to have a significant relationship with teacher readiness. Key challenges identified include limited ICT resources, poor internet connectivity, inadequate infrastructure, insufficient professional development, and lack of specialized assistive technologies. The study recommends continuous specialized training, improved ICT infrastructure, procurement of assistive technologies, and stronger institutional and policy support to advance ICT-enabled inclusive education in the district.

Keywords: Teacher Readiness; ICT-Enabled Instruction; Learning Disabilities; Inclusive Education; Assistive Technology

1. Introduction

The global movement towards inclusive education, championed by international organizations such as UNESCO and the United Nations, emphasizes the right of all children, including those with learning disabilities (LD), to access quality education within mainstream settings [1,2]. This paradigm shift necessitates a re-evaluation of traditional pedagogical approaches and the adoption of innovative strategies to address diverse learning needs [3]. Inclusive education aims to create learning environments where all students, regardless of ability, feel valued, respected, and supported to reach their full potential [4].

In the Philippines, inclusive education is guided by the Enhanced Basic Education Act of 2013 (Republic Act No. 10533), the Magna Carta for Persons with Disabilities (Republic Act No. 7277, as amended by Republic Act No. 9442), and various Department of Education (DepEd) policies [5,6]. These include the establishment of Special Education (SPED) centers and the integration of learners with disabilities into regular classrooms, as outlined in DepEd Order No. 72, s. 2009 [7]. These legislative and policy frameworks reflect the country's commitment to ensuring equitable access to

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education for all learners, including those with LD. Despite these efforts, the implementation of inclusive education continues to face challenges, particularly in resource-constrained areas such as Kabugao District I in Apayao Province. Schools in rural districts often struggle with limited infrastructure, insufficient access to assistive technologies, and a shortage of trained special education teachers [8]. Such limitations hinder the ability of schools to effectively support pupils with learning disabilities (PLD), who require individualized instruction and specialized support to overcome learning barriers and reach their full potential [9].

Learning disabilities encompass a heterogeneous group of neurobiological disorders that affect a person's ability to acquire, process, store, and use information [10]. These include dyslexia, which impairs reading fluency and decoding skills; dysgraphia, which affects handwriting and written expression; dyscalculia, which hinders mathematical reasoning and number sense; attention-deficit/hyperactivity disorder (ADHD), which impacts focus, impulse control, and executive functioning; and nonverbal learning disabilities (NVLD), which affect visual-spatial reasoning and social perception [11]. Other conditions such as auditory processing disorder (APD) and visual processing disorder (VPD) also contribute to difficulties in interpreting information despite normal hearing or vision [12]. PLD often experience challenges in academic domains such as reading, writing, and mathematics, as well as in cognitive functions including attention, memory, and executive processing [13]. These challenges can significantly impact academic achievement, emotional well-being, and overall quality of life.

In Kabugao District I, pupils with learning disabilities are present across grade levels, but formal identification remains limited due to the absence of SPED specialists and diagnostic services. Teachers often rely on classroom-based observations and informal assessments to identify learners who struggle with literacy, numeracy, and attention. The most commonly observed difficulties align with dyslexia, dysgraphia, dyscalculia, and ADHD-like behaviors. Many pupils come from indigenous communities such as the Isnag/Isnag, where multilingual environments (Isnag, Ilocano, Filipino) influence literacy development. Households often have limited access to books, digital devices, and stable electricity, which affects early literacy exposure and home-based learning. Parents may also have limited awareness of learning disabilities, leading to delayed recognition and inconsistent support at home. At the school level, most institutions in Kabugao District I lack dedicated SPED centers, and teachers handle multi-grade classes with diverse learning needs. Assistive technologies such as tablets, text-to-speech tools, or specialized software are scarce, and teachers report difficulties in providing individualized instruction due to large class sizes, multi-grade setups, and insufficient training in LD-specific strategies. Learners suspected of dyslexia struggle with decoding and reading fluency, those with dysgraphia exhibit poor handwriting and spelling errors, pupils with dyscalculia show persistent difficulty understanding basic number concepts, and learners with attention difficulties display distractibility and inconsistent task completion. Some pupils also show signs of NVLD, particularly challenges in visual-spatial tasks and social interpretation. These learning profiles highlight the urgent need for structured, differentiated, and technology-supported instruction.

Traditional approaches to supporting PLD often rely on resource-intensive interventions such as one-on-one tutoring, small-group instruction, individualized education plans (IEPs), and specialized curricula [14]. While effective, these methods may not be feasible in rural or underfunded settings due to limited personnel, financial constraints, and lack of access to appropriate technologies [15]. Additionally, traditional methods may not sufficiently engage PLD, especially those with attention and behavioral challenges [16]. Information and Communication Technology (ICT) offer a promising avenue for enhancing support for PLD in Kabugao District I. ICT includes tools such as computers, tablets, educational software, online platforms, assistive technologies, and mobile devices [17]. These technologies can create interactive and inclusive learning environments tailored to the diverse needs of PLD [18]. ICT-assisted instruction can address several barriers by providing access to digital learning materials, enabling personalized instruction, and fostering motivation and engagement [10,19–21]. It also facilitates communication among teachers, students, and families, and offers assistive tools such as text-to-speech and speech-to-text software for learners with specific disabilities [22].

Empirical studies have demonstrated the effectiveness of ICT-assisted instruction for PLD. For instance, technology-based interventions have shown significant improvements in reading achievement among students with reading disabilities [23]. Computer-assisted instruction has also been found to enhance math skills in learners with dyscalculia [24]. Moreover, ICT has been shown to boost self-esteem and motivation, contributing to better academic outcomes [22]. However, implementing ICT-assisted instruction in resource-limited environments presents challenges. These include inadequate access to devices, limited internet connectivity, insufficient teacher training, and lack of technical support [25]. Addressing these issues requires a comprehensive strategy that includes infrastructure investment, professional development, and equitable access to digital tools [26–28]. It is important to recognize that ICT is not a standalone solution. Effective support for PLD must combine ICT with evidence-based teaching practices, individualized

learning plans, collaborative efforts among educators and families, and continuous assessment [29]. ICT must also be aligned with curricular goals to ensure meaningful learning experiences [30].

Given these considerations, this study is justified by the urgent need to strengthen inclusive education in rural and underserved contexts such as Kabugao District I. While national policies provide a framework for inclusion, their success depends on the readiness of teachers to implement ICT-assisted instruction effectively. Teacher readiness encompasses not only access to ICT tools but also the necessary training, confidence, and pedagogical skills to integrate technology into inclusive classrooms.

This research is motivated by the desire to bridge the gap between policy and practice. By assessing the readiness of teachers in Kabugao District I, the study will identify strengths, gaps, and challenges in current practices. The findings will serve as a basis for proposing targeted interventions, such as professional development programs, ICT infrastructure support, and policy recommendations, that can empower teachers to better support pupils with learning disabilities. Ultimately, this study seeks to contribute to the broader goal of ensuring that every child, regardless of ability or location, has access to quality, inclusive, and technology-enabled education.

2. Methodology

2.1. Research Design

The study employed a descriptive survey design to examine teachers' readiness in supporting pupils with learning disabilities through ICT-enabled instruction in Kabugao District I. This design was appropriate as it presented an accurate account of existing conditions, practices, and perceptions without experimental manipulation. Data were systematically collected to provide both quantitative insights, such as demographic profiles and levels of readiness, and qualitative insights into the challenges teachers faced in integrating ICT into inclusive classrooms. By analyzing responses statistically and thematically, the study determined the extent of teacher readiness, identified gaps in training and resources, and highlighted recurring challenges. Ultimately, the design offered a comprehensive framework for understanding teacher preparedness and served as the basis for evidence-based recommendations to strengthen ICT-enabled inclusive education.

2.2. Locale of the Study

The study was conducted in seven selected elementary schools in Kabugao District I, namely Dibagat Elementary School, Madatag Elementary School, Madduang Elementary School, Musimut Elementary School, Malabanig Elementary School, Cabetayan Elementary School, and Nagbabbalayan Elementary School. These schools were purposively chosen to represent the diverse geographic and socio-economic contexts of the district, ranging from remote upland communities to more accessible barangay centers. The selection was made in consultation with the Schools Division Office of Apayao and the District Supervisor of Kabugao District I to ensure coverage of schools with varying levels of ICT access and teacher experiences. This purposive sampling allowed the researcher to obtain a comprehensive picture of teacher readiness in different settings within the district.

2.3. Respondents of the Study

The respondents of the study were 42 elementary public-school teachers from the seven selected schools in Kabugao District I. Total enumeration was employed, meaning all teachers in the identified schools were included to maximize reliability and ensure representation of the district's teaching population. This approach recognized that readiness to support pupils with learning disabilities through ICT-assisted instruction varied according to factors such as age, length of service, grade level handled, and prior training. By involving all teachers, the study captured the full range of teacher profiles and experiences within Kabugao District I.

2.4. Research Instrumentation

The researcher used an adopted survey questionnaire as the primary instrument to gather data on teachers' readiness in supporting pupils with learning disabilities through ICT-enabled instruction in Kabugao District I. Part I covered the demographic profile of respondents, including age, sex, ICT access, length of service, and ICT training related to inclusive education. Part II measured teachers' level of readiness using a 5-point Likert scale to assess knowledge, confidence, and preparedness in integrating ICT tools. Part III focused on perceived challenges, revised to include open-ended thematic questions on issues such as ICT access, technical support, training, classroom management, school policies, and personal challenges, with prompt guides provided to elicit detailed responses.

2.5. Statistical Analysis

The study used frequency and percentage to compute the demographic profile of respondents and the weighted mean with a 5-point Likert scale to measure teacher readiness and perceived challenges in supporting pupils with learning disabilities through ICT-assisted instruction. ANOVA determined significant differences in readiness when grouped by age, length of service, and ICT training, while the t-test assessed differences based on sex. Since challenges were gathered through open-ended questions, responses were analyzed thematically into categories such as ICT access, technical support, training, classroom management, school policies, and personal challenges, with frequency counts used to identify the most common issues.

3. Results and discussion

3.1. Profile of Teachers

Table 1 Frequency distribution of respondent's profile in terms of age

Age	F	%
21–30 years old	6	15.00
31–40 years old	20	50.00
41–50 years old	10	25.00
50 years old and above	4	10.00
Total	40	100

As presented in Table 1, The age distribution indicates that most respondents are within the 31–40 age group, followed by 41–50 years old, suggesting that the teaching workforce is largely composed of mid-career professionals. This stage is crucial for ICT integration because teachers have already developed pedagogical expertise while remaining adaptable to technological innovations. This finding is supported by Tondeur et al. (2020), who found that mid-career teachers are more likely to integrate ICT effectively due to their balance of experience and openness to innovation. Similarly, Scherer et al. (2021) reported that age influences digital competence, with younger teachers demonstrating higher familiarity with technology, while older teachers rely on established teaching practices. In the Philippine context, this aligns with Republic Act 10533, which promotes ICT integration across all levels of education. Locally, Marcial (2020) found that teachers' age significantly affects their adoption of e-learning technologies, emphasizing the need for differentiated training programs.

Table 2 Frequency distribution of respondent's profile in terms of sex

Sex	F	%
Male	1	2.50
Female	39	97.5
Total	40	100

As can be seen in Table 2, The data reveal a highly skewed distribution, with 97.5% female respondents, reflecting the feminization of the teaching profession in the Philippines. According to the Department of Education, the majority of basic education teachers are female. However, gender does not significantly influence readiness. This is supported by Hatlevik et al. (2021), who found no significant gender differences in ICT competence among teachers. Similarly, a local study by Alvarez (2021) reported that gender is not a predictor of ICT integration among Filipino teachers, as competence is more strongly influenced by training and access to resources. This supports DepEd Order No. 32, s. 2017 (Gender-Responsive Basic Education Policy), which ensures equal opportunities for professional development regardless of gender.

Table 3 Frequency distribution of respondent's profile in terms of access to ICT tools and resources

Access to ICT tools and resources	F	Ranking
Smartphone	40	1
Printer/Scanner	40	1
Laptop	35	2
Internet Connectivity (Wi-fi/Data)	30	3
Tablet	4	4
Projector	4	4
Desktop Computer	2	5

As can be gleaned from Table 3, the findings show that while basic ICT tools such as smartphones are universally accessible, advanced tools like tablets, projectors, and desktop computers are limited. This indicates a gap between access to basic devices and the availability of instructional technologies needed for inclusive education. UNESCO (2021) identified inadequate ICT infrastructure as a major barrier to digital and inclusive learning globally. Similarly, Fraillon et al. (2020) emphasized that access to diverse ICT tools significantly enhances teachers' ability to implement technology-based instruction. In the Philippine context, Tria (2020) found that limited access to ICT resources during the pandemic hindered effective online teaching. This reflects ongoing challenges in implementing Republic Act 10929 and DepEd's Computerization Program, which aim to improve access but still face infrastructure limitations.

Table 4 Frequency distribution of respondent's profile in terms of length of service (years of teaching experience)

Length of service (years of teaching experience)	F	%
1-5 years old	4	10.00
6-10 years old	8	20.00
11-15 years old	18	45.00
16-20 years old	6	15.00
21 years old and above	4	10.00
Total	40	100

Table 4 shows that the most of respondents have 11–15 years of teaching experience, indicating a relatively experienced group. However, the findings suggest that experience does not necessarily translate to ICT readiness. This is supported by Darling-Hammond et al. (2020), who emphasized that continuous professional development is more critical than years of service in improving teaching effectiveness. Locally, Marcial (2020) also found that teaching experience does not significantly influence ICT integration among Filipino educators. This supports Republic Act 4670, which highlights the importance of ongoing training rather than relying solely on experience.

Table 5 Frequency distribution of respondent's profile in terms of ICT training sessions attended relative to inclusive education

ICT training sessions attended relative to inclusive education	F	Ranking
None	9	22.50
1–2 trainings	23	57.50
3–4 trainings	5	12.50
5 or more trainings	3	7.50
Total	40	100

As shown in Table 5, most respondents attended only 1–2 ICT trainings, while a significant number had no training. This suggests limited exposure to professional development in ICT and inclusive education. OECD (2021) reported that insufficient ICT training is a major barrier to effective technology integration. Likewise, Voogt et al. (2021) emphasized that the quality and relevance of training are more important than frequency. In the Philippine setting, Toquero (2021) highlighted that teacher faced difficulties in ICT integration due to lack of adequate training during the shift to digital learning. This aligns with Republic Act 11650, which calls for strengthened teacher training in inclusive practices.

3.2. Readiness of teachers to support pupils with learning disabilities through ICT- enabled instruction

Table 6 Mean distribution on the readiness of teachers to support pupils with learning disabilities through ICT- enabled instruction

Statement	Mean	DI
I have sufficient knowledge about different types of learning disabilities among pupils.	2.65	MR
I am confident in identifying pupils who may have learning difficulties during classroom instruction.	2.88	MR
I am capable of adapting my teaching strategies to accommodate pupils with learning disabilities.	2.93	MR
I am able to use ICT tools (e.g., multimedia presentations, learning applications, assistive technologies) to support pupils with learning disabilities.	3.08	MR
I am prepared to design ICT-based learning materials that are appropriate for pupils with diverse learning needs.	2.98	MR
I feel confident in integrating digital technologies to improve the participation of pupils with learning disabilities in classroom activities.	2.93	MR
I am knowledgeable about the use of assistive technologies that can help pupils with learning disabilities learn more effectively.	2.88	MR
I can modify ICT-based instructional materials to make them accessible to pupils with learning disabilities.	3.03	MR
I am willing to continuously learn and adopt new ICT tools that support inclusive education.	3.93	R
I feel prepared to provide individualized ICT-supported learning activities for pupils with learning disabilities.	3.20	MR
Category Mean	3.05	MR

As can be seen from Table 5, the overall readiness level is “Moderately Ready,” indicating that teachers possess basic competencies but lack full preparedness. Teachers showed high willingness to adopt ICT but lower competence in assistive technologies and knowledge of learning disabilities. Florian and Beaton (2021) emphasized that effective inclusive education requires both general teaching competence and specialized skills in assistive technologies. Similarly, Trust and Whalen (2020) found that teacher readiness in ICT is influenced by both training and access to digital tools. Locally, Ancho and Arrieta (2021) reported that Filipino teachers are generally willing to adopt ICT but face challenges in applying it effectively due to limited training. This supports Republic Act 11650 and DepEd Order No. 44, s. 2021.

Table 7 Test of significant difference in the level of readiness of teachers when grouped according profile in terms of age, length of service, and ICT training sessions attended

Profile	df	F	P-value	Decision
Age				
Between Groups	3	2.87	0.05	Reject H ₀
Within Group	36			
Length of Service				
Between Groups	4	1.68	0.18	Accept H ₀
Within Group	35			
ICT training sessions attended				
Between Groups	3	2.44	0.08	Accept H ₀
Within Group	36			

As can be gleaned from Table 6, The test result indicates a statistically significant difference in the level of readiness of teachers when grouped according to age ($p = 0.05$), leading to the rejection of the null hypothesis. This implies that teachers' readiness to support pupils with learning disabilities through ICT-enabled instruction varies across age groups, suggesting that age plays a meaningful role in shaping ICT competence and inclusive teaching practices. Differences in readiness may be attributed to variations in technological exposure, adaptability, and access to professional development opportunities among teachers of different age brackets.

Younger teachers tend to demonstrate higher familiarity and confidence in using digital tools, while older teachers may rely more on traditional teaching approaches and may require additional support in adapting to ICT integration. This pattern is consistent with findings that digital competence is influenced by generational exposure and continuous learning opportunities, where younger educators are more technologically inclined, while older teachers benefit from structured training and institutional support (Scherer et al., 2021; Tondeur et al., 2020; Marcial, 2020; Ancho and Arrieta, 2021; Republic Act 10533; Department of Education DepEd Order No. 42, s. 2017). These combined sources emphasize that ICT integration is not only a policy requirement but also a competency that develops unevenly across age groups depending on exposure and training.

Moreover, the result reflects a generational digital divide, where differences in readiness are shaped by varying levels of access to ICT tools and professional development. While national policies strongly advocate ICT integration and inclusive education, the significant difference observed suggests that implementation is not uniform across all teachers, particularly when age-related factors are considered (Scherer et al., 2021; Marcial, 2020; Republic Act 10533). This indicates that although policies provide a common framework, actual readiness is influenced by how teachers interact with these policies in practice.

Despite the statistical significance, the p-value (0.05) indicates a borderline level of significance, suggesting that while age contributes to differences in readiness, it is not the sole determinant. Other factors such as access to ICT resources, quality of training, and institutional support systems also play critical roles in shaping readiness (Tondeur et al., 2020; Ancho and Arrieta, 2021; Republic Act 11650). This implies that addressing disparities in readiness requires a comprehensive approach that goes beyond demographic characteristics.

As to length of service and ICT training attended, the test result indicates that there is no statistically significant difference in the level of readiness of teachers when grouped according to both length of service ($p = 0.18$) and ICT training sessions attended ($p = 0.08$), leading to the acceptance of the null hypothesis for both variables. These findings suggest that neither the number of years in teaching nor the frequency of ICT training sessions attended significantly influences teachers' readiness to support pupils with learning disabilities through ICT-enabled instruction. This implies that readiness is not determined by experience alone or by the quantity of training received, but rather by deeper factors such as the quality of training, relevance of content, access to ICT resources, and institutional support systems.

The non-significant result for length of service indicates that teaching experience does not automatically translate to competence in ICT integration, particularly in the context of inclusive education. While experienced teachers may

possess strong pedagogical knowledge, the rapidly evolving demands of ICT-enabled instruction require continuous updating of skills that cannot be acquired solely through years of service. Similarly, the non-significant result for ICT training suggests that attendance in training sessions alone is insufficient to ensure readiness, especially when such trainings are limited in scope, duration, or practical application. This is consistent with findings that effective ICT integration depends on sustained, high-quality, and context-specific professional development rather than one-time or fragmented training experiences (Darling-Hammond et al., 2020; OECD, 2021; Voogt et al., 2021; Toquero, 2021; Marcial, 2020; Republic Act 4670; Republic Act 11650; Department of Education DepEd Order No. 35, s. 2016).

Furthermore, the near-significant result for ICT training ($p = 0.08$) suggests that while training may have some influence on readiness, its current implementation may not be sufficient to produce measurable differences across groups. This indicates that professional development programs need to be more intensive, continuous, and focused on practical ICT integration strategies, particularly in supporting learners with disabilities. The findings also reinforce the principle under the Philippine Professional Standards for Teachers (DepEd Order No. 42, s. 2017) that teacher competence is developed through ongoing learning and reflective practice, rather than being determined by tenure or isolated training experiences.

Table 8 Test of significant difference in the level of readiness of teachers when grouped according profile in terms of sex

Indicator	t-tabular	df	P-Value	Decision
Sex	1.48	38	0.146	Accept H_0

Table 7 test result indicates no significant difference in the level of readiness between male and female teachers ($p = 0.146$), suggesting that gender does not influence readiness in ICT-enabled inclusive instruction. However, this finding should be interpreted with caution due to the extremely unequal distribution of respondents, where females overwhelmingly dominate the sample. Despite this limitation, the result is consistent with existing literature indicating that ICT competence is not determined by gender but by access to resources, training, and institutional support. For instance, Hatlevik et al. (2021) found no significant gender differences in digital competence among teachers. Similarly, local research by Alvarez (2021) reported that ICT adoption among Filipino teachers is influenced more by professional development opportunities than by demographic factors such as sex. This aligns with the Gender and Development framework implemented by the Department of Education, particularly DepEd Order No. 32, s. 2017, which promotes gender equality in education and ensures equal access to training and resources. The findings therefore reinforce the conclusion that readiness is a function of systemic and professional factors rather than inherent personal characteristics, highlighting the importance of equitable access to ICT training and infrastructure for all teachers.

3.3. Perceived Challenges in Supporting Pupils with Learning Disabilities through ICT-Enabled Instruction

Table 9 shows the teachers' responses which reveals that the challenges encountered in supporting pupils with learning disabilities through ICT-enabled instruction are interconnected and systemic in nature, encompassing issues related to access to ICT resources, training and professional development, infrastructure, and availability of assistive technologies. These challenges collectively indicate that while teachers demonstrate willingness to integrate ICT in inclusive education, their capacity to do so effectively is constrained by multiple structural limitations.

A major concern identified is the limited access to ICT resources, where teachers reported high costs of digital tools, unreliable internet connectivity, and restricted availability of appropriate devices. Although basic ICT tools are present, access to specialized and inclusive technologies remains inadequate, limiting the effectiveness of ICT integration. This challenge is consistent with findings that insufficient ICT resources hinder the delivery of inclusive and technology-driven instruction (UNESCO, 2021; Tria, 2020; Republic Act 10929; Republic Act 11650).

Closely related to this is the issue of insufficient training and professional development, as teachers expressed a lack of opportunities for specialized ICT training focused on inclusive education. While some teachers have attended training sessions, these are often limited, inconsistent, and lacking in practical application. This suggests that readiness is influenced not merely by exposure to training but by its quality and relevance. Effective ICT integration requires sustained, context-specific professional development, which remains a challenge in the current system (OECD, 2021; Voogt et al., 2021; Toquero, 2021; Department of Education DepEd Order No. 35, s. 2016).

Furthermore, teachers highlighted inadequate ICT infrastructure, including outdated equipment, insufficient school facilities, and limited availability of hardware. These constraints reflect broader systemic issues in resource allocation

and school-level support, which directly affect the implementation of ICT-enabled instruction. The presence of outdated or insufficient infrastructure limits teachers' ability to utilize digital tools effectively, particularly in addressing the needs of diverse learners. This finding aligns with studies emphasizing that infrastructure readiness is a critical component of successful ICT integration (UNESCO, 2021; Fraillon et al., 2020; Tria, 2020).

Table 9 Perceived Challenges in Supporting Pupils with Learning Disabilities through ICT-Enabled Instruction

Theme	Code	Description	Verbatim Responses
Limited Access to ICT Resources	High Cost of ICT	ICT tools and software are expensive and beyond budget capacity	"High cost of specialized software" / "Budget limits prevents purchasing software"
	Poor Internet Connectivity	Internet access is unstable, slow, or unreliable	"Poor internet power" / "Unreliable internet connection"
	Limited ICT Devices	Insufficient number of ICT devices available for teaching	"Limited ICT tools, devices, and resources" / "Restricted technology access"
	Restricted Access to Tools	Difficulty accessing appropriate ICT tools for inclusive instruction	"Limited access to appropriate ICT tools for inclusive education"
Insufficient Training and Professional Development	Lack of Training	Teachers have minimal or no ICT-related training	"Insufficient ICT training for inclusive education"
	Limited Training Opportunities	Few seminars or workshops are available	"Limited opportunities for ICT-focused training"
	Lack of Specialized Skills	Teachers lack expertise in assistive technologies	"Lack of skills in using assistive technology"
	Need for Continuous Training	Teachers express the need for ongoing professional development	"Need more ICT training for inclusive teaching"
Inadequate ICT Infrastructure	Outdated Equipment	Existing ICT tools are old and cannot support modern applications	"Outdated ICT equipment" / "Old hardware cannot support software"
	Insufficient School Facilities	Schools lack adequate ICT resources and facilities	"Insufficient ICT equipment in school"
	Limited Hardware Availability	Not enough devices for all learners	"Limited number of ICT devices"
	Poor System Support	Weak ICT infrastructure and system capability	"School ICT infrastructure is lacking"
Lack of Specialized Assistive Technologies	Absence of Assistive Tools	Lack of tools designed for learners with disabilities	"Lack of assistive technology for learners"
	Limited Adaptive Devices	Few adaptive tools are available	"Shortage of adaptive tools like speech-to-text"
	Lack of Inclusive Software	Limited availability of specialized programs for diverse learners	"Limited specialized ICT tools for learning disabilities"
	Accessibility Issues	ICT tools are not designed for learners with special needs	"Not enough tools designed for learners with disabilities"

Another critical challenge is the lack of specialized assistive technologies, which are essential for supporting learners with disabilities. Teachers reported a scarcity of adaptive tools, inclusive software, and assistive devices, which significantly limits their ability to provide differentiated instruction. Inclusive education requires not only general ICT tools but also specialized technologies that address specific learning needs. The absence of such tools highlights a gap between policy intentions and actual implementation in schools (Florian and Beaton, 2021; Ancho and Arrieta, 2021; Republic Act 11650; Department of Education DepEd Order No. 44, s. 2021).

The findings demonstrate that these challenges are not isolated but are mutually reinforcing, where limitations in one area exacerbate difficulties in others. For instance, inadequate infrastructure restricts access to ICT tools, while insufficient training limits teachers' ability to maximize available resources. Despite strong policy frameworks promoting ICT integration and inclusive education, such as Republic Act 10533 and Republic Act 11650, the results suggest that implementation gaps persist at the school level. Addressing these challenges requires a holistic and systemic approach, including increased investment in ICT resources, continuous and specialized teacher training, and the provision of assistive technologies to ensure that all learners, particularly those with disabilities, can benefit from ICT-enabled instruction.

3.4. Policy recommendation

Table 10 Propose policy recommendations

Weakness/Issue Identified	Policy Recommendation	Responsible Agency/Office
Teachers have limited knowledge and skills in identifying pupils with learning disabilities.	Institutionalize mandatory and continuous professional development programs on inclusive education, learning disabilities, and differentiated instruction for teachers.	Department of Education, School Administrators
Limited teacher competence in assistive technologies and ICT-enabled inclusive instruction.	Develop and implement specialized ICT training policies focusing on assistive technologies and inclusive digital pedagogy.	Department of Education, Teacher Education Institutions
Insufficient ICT resources such as tablets, projectors, and reliable internet connectivity.	Formulate policies ensuring equitable allocation and distribution of ICT resources and internet access in schools.	Department of Education, Local Government Units
Inadequate ICT infrastructure and outdated equipment in schools.	Establish sustainable funding and infrastructure development policies for upgrading ICT facilities and digital learning environments.	Department of Education, Department of Budget and Management, Local Government Units
Lack of assistive technologies for learners with disabilities.	Create policies supporting the procurement and integration of assistive technologies and adaptive learning tools in schools.	Department of Education, School Administrators
Existing ICT trainings are limited and lack practical application.	Strengthen policies on sustained, hands-on, and school-based ICT professional development programs for teachers.	Department of Education, Teacher Training Providers
Gaps in implementation of ICT-enabled inclusive education programs.	Establish monitoring and evaluation policies to regularly assess the implementation and effectiveness of inclusive ICT education programs.	Department of Education, School Heads, District Offices

4. Conclusion

The study concludes that teachers in Kabugao District I are only moderately ready to support pupils with learning disabilities through ICT-enabled instruction, possessing basic competence and a positive disposition toward technology integration but falling short of the full preparedness required for effective inclusive teaching. While teachers demonstrate a commendable willingness to learn and adopt ICT tools, their limited knowledge of learning disability types, insufficient skills in utilizing assistive technologies, and inadequate capacity to design and modify ICT-based instructional materials for diverse learners significantly constrain their effectiveness in inclusive classrooms. Among the profile variables examined, only age was found to significantly influence teacher readiness, suggesting a

generational digital divide where younger teachers tend to be more technologically adept, while length of service, sex, and frequency of ICT training attended did not produce significant differences, indicating that mere experience and exposure to training, without depth, quality, and practical application, are insufficient determinants of readiness. The study further concludes that teachers' capacity to implement ICT-enabled inclusive instruction is compounded by persistent systemic challenges, including limited access to advanced ICT devices, poor internet connectivity, outdated school infrastructure, and a critical absence of specialized assistive technologies, all of which collectively widen the gap between national inclusive education policy intentions and actual classroom-level implementation. Therefore, bridging this gap requires a coordinated and sustained effort from the Department of Education, local government units, and school administrators to invest in upgraded ICT facilities, provide continuous and specialized professional development, procure assistive technologies, and establish robust institutional support systems that will genuinely empower teachers to deliver quality, inclusive, and technology-enabled education for all learners, particularly those with learning disabilities.

Compliance with ethical standards

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

Disclosure of conflict of interest

Authors 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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