

ASSESSING ASSISTIVE TECHNOLOGIES UTILIZATION IN SUPPORTING STUDENTS' READING AND WRITING SKILLS IN SPECIAL NEEDS EDUCATION



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Assessing Assistive Technologies Utilization in Supporting Students' Reading and Writing Skills in Special Needs Education

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Abstract

The study examined the extent of assistive technology (AT) use and its influence on learners' reading comprehension and writing performance in inclusive classrooms in Lapu-Lapu City during the school year 2025–2026, providing a basis for an intervention plan. A pretest–posttest quasi-experimental design was employed to assess changes in performance, while correlation analysis determined the relationship between AT utilization and literacy outcomes. Findings revealed that teachers held highly positive perceptions of assistive technology, recognizing its potential to enhance learning and inclusivity. However, the frequency of AT use was only moderate, indicating that actual classroom integration remained limited. Results showed a significant improvement in students' writing skills following the intervention, suggesting that targeted instructional strategies effectively supported written expression. In contrast, no significant difference was observed in reading comprehension scores, suggesting that the intervention had a limited effect on reading performance. Correlation analysis further revealed very weak and statistically insignificant relationships between the extent of AT utilization and learners' posttest performance in both reading and writing. This indicates that while instructional approaches can directly foster skill improvement, the mere use or frequency of AT tools does not necessarily lead to academic gains. Overall, the study highlights the importance of purposeful and systematic integration of assistive technology into classroom instruction. Strengthening teacher training, ensuring access to appropriate AT tools, and aligning technology use with pedagogical goals are essential to maximize its potential benefits. Consequently, the study recommends implementing an intervention plan to promote equitable access to assistive technologies that support all learners in inclusive educational settings.

Keywords: *assistive technology, inclusive classroom, reading comprehension, writing skills, intervention plan, mixed-method*

Introduction

In today's inclusive classrooms, students come from diverse backgrounds and possess a wide range of learning needs that traditional teaching methods may not always meet. Among these learners are students with learning disabilities who often struggle with reading comprehension, writing, and information processing—skills vital to academic success.

To create an environment that supports every learner, assistive technology (AT) provides alternative ways to access lessons, complete tasks, and participate meaningfully in class. When properly used, AT promotes independence, motivation, and confidence among students. Tools such as graphic organizers, speech-generating devices, and adaptive learning software have been shown to improve engagement and achievement, especially in reading and writing activities.

However, research shows that challenges remain in the effective use of AT. There is still limited data on how AT directly affects academic outcomes in inclusive classrooms. Factors such as the frequency of AT use, teacher training, and classroom implementation also influence its effectiveness. Some students with learning difficulties hesitate to use assistive tools because of stigma, while schools often face problems with funding, availability of resources, and lack of training.

At Sudtonggan National High School in the Lapu-Lapu City Division, inclusive education programs exist but are often limited by these same challenges. To address this gap, the present study examined how assistive technology is used and how it affects students' academic performance in reading and writing during the 2025–2026 school year. The study aims to provide data that can guide teachers and administrators in developing targeted intervention plans to better support learners in inclusive classrooms.

Research Questions

This study investigated the extent of utilization of assistive technology and its impact on reading comprehension and writing skills performance of learners in inclusive classrooms at Sudtonggan National High School, Lapu-Lapu City Division, during the school year 2025-2026 as a basis for an Intervention Plan in special needs education programs. Specifically, this sought to answer the following sub-problems:

1. What is the extent of utilization among the teacher-respondents of assistive technology in inclusive classroom settings according to:
 - 1.1. assistive technology utilization;
 - 1.2. frequency of assistive technology use; and
 - 1.3. perceived impact of assistive technology on learning?
2. What is the reading comprehension skill performance of the respondents as to pre-test and post-test?

3. What is the writing skill performance of the respondents as to pre-test and post-test?
4. Is there a significant difference between the pre and post-test performance of the respondents as to:
 - 4.1. reading comprehension skill performance; and
 - 4.2. writing skill performance?
5. Is there a significant relationship between the extent of utilization among the teacher-respondents of assistive technology in inclusive classroom settings and the post-test reading comprehension and writing skills performance of learner-respondents?
6. Based on the findings of the study, what intervention plan can be proposed?

Literature Review

Extent of Utilization of Assistive Technology in Inclusive Classrooms

Assistive technology (AT) plays a vital role in promoting equitable access to learning for students with disabilities in inclusive classrooms. According to Edyburn (2020), AT encompasses tools, devices, and software that support learners with special needs in performing academic tasks that may otherwise be challenging. Teachers' extent of AT utilization is influenced by factors such as resource availability, training, and administrative support (Alnahdi, 2020). Studies show that while teachers generally hold positive attitudes toward AT, its classroom use often remains limited to basic or low-tech tools like visual aids, graphic organizers, and audio materials (Ok, Kim, & Rao, 2021). Effective integration requires not only awareness but also competence and confidence among teachers in selecting and implementing appropriate technologies that match individual learner needs (Bouck & Flanagan, 2019).

Frequency of Assistive Technology Use

The frequency of AT use determines how consistently learners benefit from its features. Research by Marino et al. (2020) emphasizes that frequent, structured use of AT fosters greater academic engagement and autonomy among students with learning difficulties. However, inconsistent or occasional use of AT may reduce its potential effectiveness (Dell, Newton, & Petroff, 2021). Teachers who use AT regularly are more likely to observe gains in learner motivation, task completion, and comprehension (Spooner et al., 2021). However, challenges such as insufficient technical support and limited instructional time often hinder consistent AT implementation in inclusive classrooms.

Perceived Impact of Assistive Technology on Learning

Teachers' perceptions greatly influence the adoption and success of AT integration. When teachers perceive AT as beneficial, they are more inclined to integrate it meaningfully in their lessons (Kats, 2019). Studies indicate that AT enhances access to the curriculum, encourages participation, and builds learners' confidence and independence (McNicholl et al., 2021). Nevertheless, some educators remain uncertain about its long-term impact on academic achievement due to limited exposure to research-based evidence and professional training (Cummings et al., 2020). This perception gap highlights the need for systematic capacity-building programs to strengthen teachers' beliefs and competence in using AT effectively.

Assistive Technology and Reading Comprehension Performance

Several studies confirm that assistive technology improves reading comprehension, particularly for learners with reading and language difficulties. Tools such as text-to-speech software, audiobooks, and digital reading platforms have been found to enhance comprehension, vocabulary development, and fluency (Wood et al., 2018). According to Elkind, Cohen, and Murray (2019), these tools reduce cognitive load by allowing learners to focus on understanding meaning rather than decoding words. However, the effectiveness of AT in improving reading depends on its frequency of use and alignment with learners' specific needs (Reed & Lahm, 2018). In some cases, gains in comprehension may not be statistically significant if AT is not consistently or appropriately applied.

Assistive Technology and Writing Skills Performance

Writing is a complex skill that demands organization, vocabulary, and motor coordination. AT supports this process by offering tools such as word prediction software, speech-to-text programs, and digital graphic organizers (Peterson-Karlan, 2017). These tools help learners generate ideas, organize content, and reduce mechanical errors. Studies have shown that students who use AT for writing tasks demonstrate improvements in output length, coherence, and spelling accuracy (Carter et al., 2020). In inclusive classrooms, AT not only aids students with physical or learning disabilities but also enhances the overall writing performance of the entire class when used as a universal design approach (Ok et al., 2021). Nonetheless, as Alnahdi (2020) emphasized, technology alone cannot replace effective instruction; it must complement pedagogical strategies to achieve meaningful improvement in writing.

Relationship Between AT Utilization and Academic Performance

Empirical evidence suggests that while AT can facilitate learning, its mere use does not automatically lead to improved academic performance. The impact of AT depends on how effectively teachers integrate it into instruction (Bouck, 2021). Research by Marino et al. (2020) found weak correlations between the frequency of AT use and post-test academic gains, implying that pedagogical quality plays a greater role in learner success. Therefore, integrating AT within structured, evidence-based teaching practices is essential to maximize learning outcomes.

Developing an Intervention Plan

Based on the literature, effective intervention plans should include systematic teacher training, resource allocation, and continuous monitoring of AT implementation (Kats, 2019). Professional development focusing on both technical and pedagogical aspects of AT ensures that teachers can select appropriate tools for diverse learners. Moreover, collaboration among teachers, administrators, and parents enhances sustainability and alignment with inclusive education goals (UNESCO, 2020).

Methodology

Research Design

This study utilized a quantitative research design employing a one-group pretest–posttest quasi-experimental design. It aimed to determine the effect of assistive technology (AT) on learners' reading comprehension and writing skills in inclusive classrooms. Since random assignment of participants was not feasible in the school setting, a single group of students under the special needs education program was assessed before and after the implementation of assistive technology. This design allowed the researcher to measure changes in performance and identify potential cause-and-effect relationships between AT utilization and literacy outcomes.

Respondents

The respondents in the study were teachers and learners in the special needs education and inclusive programs of Sudtonggan National High School, Lapu-Lapu City Division. The teacher-respondents used assistive technology (AT) in classroom instruction, while the learner-respondents were students with diverse learning needs who participated in the pretest and posttest activities. The teachers provided data on the extent, frequency, and perceived impact of AT use, and the learners' performance results were used to assess the effectiveness of AT in improving reading comprehension and writing skills.

Instrument

The study utilized a researcher-made questionnaire and pretest–posttest assessments as the primary instruments for data collection. The questionnaire collected information on the extent, frequency, and perceived impact of assistive technology (AT) use among teacher respondents in inclusive classrooms. It consisted of items rated using a Likert scale to quantify responses.

For learner-respondents, standardized pretest and posttest instruments were administered to measure their reading comprehension and writing performance before and after the implementation of assistive technology. Experts in special and inclusive education validated these instruments to ensure reliability and content validity before distribution.

Procedure

The study followed a systematic process to ensure accurate data collection and analysis. First, a letter of permission was submitted to the school principal and division office to conduct the research at Sudtonggan National High School. Upon approval, the researcher conducted an ocular observation and coordinated with special needs and inclusive education teachers to administer the instruments.

A pretest on reading comprehension and writing skills was given to the learners before the introduction of assistive technology. The implementation phase lasted for 14 days, during which various assistive tools were utilized in classroom instruction. After the intervention period, a posttest was administered to measure any improvement in learners' performance.

Simultaneously, teacher-respondents completed a questionnaire assessing the extent, frequency, and perceived impact of assistive technology use. All collected data were encoded, tabulated, and analyzed using appropriate statistical tools to determine significant differences and relationships among variables. Finally, based on the findings, an intervention plan was proposed to enhance assistive technology integration in inclusive classrooms.

Data Analysis

The data collected from the questionnaires and pretest–posttest assessments were encoded, tabulated, and statistically analyzed to address the research problems. Descriptive statistics, such as mean and standard deviation, were used to determine the extent, frequency, and perceived impact of assistive technology (AT) utilization among teacher-respondents.

For learners' performance, mean scores were computed to describe their reading comprehension and writing skills across the pretest and posttest. To determine whether there was a significant difference between pretest and posttest scores, a paired-samples t-test was used. Moreover, the Pearson product–moment correlation coefficient (r) was used to identify the relationship between the extent of AT utilization and learners' posttest performance in reading and writing.

All analyses were conducted at the 0.05 level of significance, which served as the basis for rejecting or failing to reject the null hypotheses. The results were then interpreted to support the formulation of an intervention plan for inclusive education.

Ethical Considerations

The study adhered to the university's and the Department of Education's ethical standards to ensure transparency, safety, and respect



for all participants. Before data collection, informed consent was obtained from the school principal, teachers, and learners. Participation was voluntary, and respondents were accommodated at their convenience.

In compliance with the Data Privacy Act of 2012 (R.A. 10173), all information gathered was treated with strict confidentiality and used solely for academic and research purposes. The researchers ensured that data processing was limited to what was necessary to achieve the study’s objectives and that no personal or sensitive information was disclosed to unauthorized persons.

Results

This section presents, analyzes, and interprets the data gathered to answer the study's research questions. It discusses the extent of assistive technology (AT) use among teacher-respondents and learners' reading and writing performance based on pretest and posttest results. Furthermore, it examines the significant differences between these two tests and explores the relationship between the extent of AT utilization and learners’ posttest performance in reading and writing.

The inclusion of the sub-variables—Assistive Technology Utilization, Frequency of Assistive Technology Use, and Perceived Impact of Assistive Technology on Learning—is essential in providing a comprehensive understanding of how AT is integrated and experienced in inclusive classrooms. These variables collectively provide a holistic picture of AT engagement by highlighting access, consistency of use, and perceived contribution to learning outcomes. Together, they offer deeper insight into the effectiveness of assistive technology in enhancing teaching and learning processes in inclusive education settings (Al-Azawei et al., 2016; Dell et al., 2017; Ok et al., 2021)

Table 1. *Assistive Technology Integration*

No	Survey Indicators	\bar{x}	SD	VD
1	I believe assistive technology improves learning outcomes.	4.70	0.47	Strongly Agree
2	I feel confident integrating assistive technology into my lessons.	4.53	0.63	Strongly Agree
3	Using AT helps foster student independence.	4.17	0.75	Agree
4	Assistive technology makes my teaching more effective.	4.50	0.63	Strongly Agree
5	I am motivated to use AT even without external incentives.	4.33	0.76	Strongly Agree
6	I see the value of AT for students with learning difficulties.	4.37	0.67	Strongly Agree
7	AT use is worth the time and effort it requires.	4.53	0.57	Strongly Agree
Overall		4.45	0.64	Strongly Agree

The findings show that teacher-respondents have a very positive perception of assistive technology (AT), with an overall mean of 4.45 (Strongly Agree). Teachers strongly agreed that AT improves learning outcomes, enhances teaching effectiveness, and supports learners with difficulties. They also expressed confidence in integrating AT into lessons. However, the slightly lower mean on fostering student independence suggests that while teachers value AT, further training may be needed to maximize its role in promoting learner autonomy.

These results are consistent with those of Okolo and Bouck (2019), who emphasized that positive teacher attitudes toward AT are essential to its successful implementation.

Similarly, Judge, Floyd, and Jeffs (2018) found that teacher confidence and belief in AT’s benefits predict its effective classroom use, while Dell, Newton, and Petroff (2017) highlighted that teacher motivation and understanding directly influence AT’s impact on student learning. Overall, the results indicate a high level of readiness and positive attitude among teachers toward integrating AT in inclusive education settings.

Table 2. *Frequency of Assistive Technology Use*

No	Survey Indicators	\bar{x}	SD	VD
1	Text-to-speech software	2.97	1.19	Sometimes
2	Speech-to-text applications	2.93	1.05	Sometimes
3	Screen magnification tools	3.30	1.24	Sometimes
4	Audio books or recorded lessons	3.40	1.04	Often
5	Communication boards/devices (e.g., AAC tools)	3.23	1.14	Sometimes
6	Digital graphic organizers (e.g., mind mapping software)	3.30	1.06	Sometimes
7	Visual schedules or pictorial cues	3.37	1.16	Sometimes
8	Tablets or mobile apps designed for special education	3.03	1.45	Sometimes
9	Adaptive keyboards or mice	3.23	1.30	Sometimes
Overall		3.20	1.18	Sometimes

The table indicates that teacher-respondents reported a moderate frequency in using various assistive technology (AT) tools, with an overall mean of 3.20 (Sometimes) and a standard deviation of 1.18, suggesting some variability in utilization among teachers. Among specific tools, audio books or recorded lessons were used most frequently (M = 3.40, SD = 1.04, Often), followed by visual schedules or pictorial cues (M = 3.37, SD = 1.16, Sometimes). Other tools, such as screen magnification tools (M = 3.30), digital graphic organizers (M = 3.30), and communication boards or devices (M = 3.23), were used occasionally. Less frequently utilized tools included



text-to-speech software (M = 2.97), speech-to-text applications (M = 2.93), tablets or special education apps (M = 3.03), and adaptive keyboards or mice (M = 3.23).

These results suggest that while teachers recognize the benefits of AT, actual classroom implementation is moderate and selective, favoring tools that are more accessible, easy to use, and require minimal specialized training. High-tech or more advanced tools—such as adaptive keyboards, tablets, and speech-to-text software—are less frequently employed, likely due to limited training, resources, or familiarity. This pattern is consistent with trends in inclusive education, where teachers often rely on tools with which they are comfortable rather than fully exploring the range of available AT options.

Previous studies support these findings. Alkahtani (2019) highlighted that teachers’ limited experience and professional development often constrain the use of advanced AT in classroom settings. Similarly, Edyburn (2018) observed that although AT is available, utilization often remains low due to insufficient training and institutional support. Flanagan, Bouck, and Richardson (2013) also noted that low-tech tools are more commonly used because they are easier to integrate into instruction, whereas more transformative digital tools remain underutilized, illustrating the gap between access and effective implementation.

Overall, while teachers use AT moderately in practice, there is substantial potential to increase both the frequency and variety of its use through targeted professional development, adequate resource allocation, and supportive school policies.

Table 3. *Impact of Assistive Technology on Learning*

No	Survey Indicators	\bar{x}	SD	VD
1	Students who use AT demonstrate better focus and attention.	4.30	0.70	Strongly Agree
2	AT helps students complete academic tasks more independently.	4.13	0.78	Agree
3	AT improves students’ reading comprehension.	4.00	0.79	Agree
4	Students using AT show greater participation in class activities.	4.47	0.63	Strongly Agree
5	AT contributes to improvements in students’ overall academic progress.	4.30	0.65	Strongly Agree
Overall		4.24	0.71	Strongly Agree

The table illustrates teacher-respondents’ perceptions of the impact of assistive technology (AT) on student learning. With an overall mean of 4.24 (Strongly Agree) and a standard deviation of 0.71, the data indicate strong and consistent recognition of AT’s benefits across the items. The highest agreement was observed for statements regarding increased student participation in class activities (M = 4.47, SD = 0.63), improved focus and attention (M = 4.30, SD = 0.70), and contributions to overall academic progress (M = 4.30, SD = 0.65). Other areas, such as supporting students’ independent task completion (M = 4.13) and enhancing reading comprehension (M = 4.00), were rated slightly lower but still reflected positive perceptions.

These results suggest that teachers view AT as an effective means of promoting engagement, attention, and active participation—key elements of inclusive classroom management. Additionally, AT is recognized for supporting student independence and overall learning progress, though its perceived effect on reading comprehension is somewhat less pronounced. Overall, teachers appear to value AT primarily as a facilitative tool that enhances learning, motivation, and access rather than as a substitute for instructional methods.

The findings align with previous research highlighting the benefits of AT for learners with diverse needs. Okolo and Bouck (2017) emphasized that AT promotes independence, task completion, and engagement, particularly among students with disabilities. Judge, Floyd, and Jeffs (2018) noted that teachers’ attitudes toward AT strongly influence its classroom effectiveness, with more motivated teachers achieving better learning outcomes. Similarly, Dell, Newton, and Petroff (2017) argued that AT can enhance cognitive development and academic progress when tools are appropriately matched to students’ needs and integrated into effective teaching strategies. Edyburn (2023) further stressed that AT achieves its most significant impact when it complements rather than replaces structured instructional practices.

In conclusion, the results demonstrate that teachers recognize AT as a valuable tool for fostering engagement, focus, participation, independence, and academic progress, reinforcing its important role in inclusive education settings.

Table 4. *Reading Comprehension Skill Performance of the Students*

Skills Performance	Mean	Standard Deviation	Std. Error Mean
Pretest Scores	17.4400	6.84398	1.36880
Posttest Scores	18.7200	6.12726	1.22545

The table presents the pre-test and post-test performance of the respondents, revealing an overall improvement in mean scores. The pre-test mean was 17.44 (SD = 6.84, SEM = 1.37), which increased to 18.72 (SD = 6.13, SEM = 1.23) on the post-test. This increase in mean score indicates a positive change in learners’ skills performance following the intervention. The relatively stable standard deviations suggest that this improvement was generally consistent across the group rather than driven by outliers. The standard error of the mean (SEM) further supports the reliability of the observed mean scores as estimates of learners’ performance.

These results imply that the instructional strategies or interventions implemented between the pre-test and post-test had a beneficial effect on learners’ skills development. While the improvement is modest, it demonstrates a consistent upward trend, indicating that learners effectively applied the strategies, tools, or supports introduced during the intervention. This observation aligns with the

principle that structured, scaffolded, and evidence-based instruction can yield measurable gains in learners' academic abilities over time.

These findings are supported by previous research on targeted instruction. Harris, Graham, and Adkins (2015) emphasized that explicit and scaffolded teaching strategies facilitate skill acquisition, particularly in literacy and writing. Similarly, Slavin (2018) noted that evidence-based interventions produce incremental but meaningful improvements in learners' outcomes. Bouck (2016) also highlighted that the use of adaptive supports and differentiated teaching approaches enhances students' opportunities to develop academic skills, particularly in inclusive or self-contained classroom settings.

In summary, the data indicate that the instructional approach positively influenced learners' skills performance, underscoring the value of structured and supportive teaching methods in promoting consistent academic growth.

Table 5. Writing Skill Performance of the Students

Skills Performance	Mean	Standard Deviation	Std. Error Mean
Pretest Scores	2.8400	1.37477	0.27495
Posttest Scores	3.4000	1.22474	0.24495

These findings are consistent with prior research emphasizing the benefits of structured, targeted writing instruction. Harris, Graham, and Adkins (2015) stressed that explicit writing strategies and regular practice lead to measurable gains in students' writing abilities. Slavin (2018) noted that evidence-based teaching approaches, including scaffolding and guided instruction, promote steady improvement even in diverse or inclusive classrooms. Bouck (2016) further emphasized that adaptive supports, such as technological tools or differentiated instruction, enhance skill development for students with varied learning needs.

In conclusion, the data indicate that the applied instructional intervention effectively improved learners' writing performance, underscoring the importance of structured, scaffolded, and supportive teaching strategies in fostering literacy development.

Table 6. Significant Difference Between Pre-Post Test Performance of the Respondents in Reading Comprehension

Variables under Comparative Inference	Mean Difference (Pre-test – Post-test)	t-value	Sig. (2-tailed)	Decision	Results
Reading Comprehension Skill Performance	-1.507	-1.280	0.145	Fail to reject Ho	Not significant

The table presents the results of the comparative analysis of respondents' reading comprehension skills before and after the intervention. The mean difference between the pre-test and post-test scores was -1.507, with a t-value of -1.280 and a two-tailed significance level of 0.145. Since the p-value exceeds the conventional threshold of 0.05, the null hypothesis was not rejected, indicating that the observed difference is not statistically significant.

This suggests that, although there was a slight increase in post-test scores, the improvement in reading comprehension cannot be attributed with confidence to the intervention. The findings imply that the instructional strategies employed may have had only a modest effect on reading performance, or that additional instructional support, extended practice, or alternative strategies might be necessary to achieve statistically significant gains.

It is also important to note that a lack of statistical significance does not necessarily indicate that the intervention was ineffective; instead, it suggests that the observed improvement may fall within the range of natural variability among learners. Factors such as sample size, duration of the intervention, and individual differences in learners' abilities could have influenced the outcome.

In summary, the analysis highlights the need for further instructional reinforcement or adjustments to support reading comprehension development better and achieve measurable, statistically significant improvements in learners' performance.

Table 7. Significant Difference Between Pre-Post Test Performance of the Respondents in Writing Skill Performance

Variables under Comparative Inference	Mean Difference (Pre-test – Post-test)	t-value	Sig. (2-tailed)	Decision	Results
Writing Skill Performance	-3.055	-3.055	0.005	Reject Ho	Significant

The table displays the results of a paired-sample t-test assessing whether the instructional intervention had a significant effect on respondents' writing skill performance. The analysis yielded a t-value of -3.055 with a two-tailed p-value of 0.005, and the mean difference between pre-test and post-test scores was -0.560. Because the p-value is below the 0.05 significance threshold, the null hypothesis was rejected, indicating a statistically significant improvement in writing skills following the intervention.

The negative t-value and mean difference reflect that post-test scores exceeded pre-test scores, demonstrating a measurable enhancement in learners' writing performance. This significant improvement suggests that the instructional strategies implemented—such as structured guidance, scaffolding, and targeted writing exercises—effectively supported learners in organizing ideas, using proper grammar and vocabulary, and communicating more clearly. Although the mean difference of -0.560 may appear moderate, it represents meaningful progress across the group of respondents.

These results align with previous research highlighting the effectiveness of explicit and scaffolded writing instruction. Graham and Perin (2007) emphasized that structured writing programs lead to tangible gains in students' writing abilities. Similarly, Slavin (2018) noted that evidence-based instructional approaches, when applied consistently, produce significant improvements even in relatively short-term interventions. Bouck (2016) further underscored that adaptive supports and differentiated teaching strategies enhance writing skill development, particularly in inclusive or diverse classroom contexts.

Table 8. *Extent of Utilization of Assistive Technology among Teachers in Self-contained or Inclusive Classroom Settings and the Post-test Reading Comprehension and Post-Test Writing Skills Performance of Learners*

<i>Variables under Correlative Inference</i>	<i>Comp. rho</i>	<i>Strength of Correlation</i>	<i>p-value</i>	<i>Decision</i>	<i>Results</i>
Assistive Technology and Post-test Reading Comprehension	-0.089	Very weak	0.672	Fail to reject Ho	Not significant
Extent of Utilization of Assistive Technology and Post-test Writing Skills Performance	0.051	Very weak	0.808	Fail to reject Ho	Not significant

The table presents the correlation between the extent of teachers' utilization of assistive technology (AT) in self-contained or inclusive classroom settings and learners' post-test performance in reading comprehension and writing skills. The computed correlation coefficients were very weak for both reading comprehension ($\rho = -0.089$, $p = 0.672$) and writing skills ($\rho = 0.051$, $p = 0.808$), and neither reached statistical significance at the 0.05 level. These results indicate that there is no meaningful linear relationship between the frequency or extent of AT use by teachers and learners' performance in the assessed areas.

This suggests that while AT may support classroom activities, its mere presence or use does not automatically translate into improved reading or writing outcomes. The findings could be influenced by factors such as the quality of AT integration, the level of teacher training, learners' familiarity with the tools, or the instructional methods used alongside AT. More structured, targeted, and pedagogically integrated use of AT may be required to produce measurable effects on learners' academic performance.

In summary, the very weak, non-significant correlations indicate that simply increasing the quantity of AT use is not sufficient to enhance learners' reading comprehension or writing skills. Effective utilization likely depends on intentional instructional strategies, teacher proficiency, and alignment with learners' specific needs.

Discussion

Based on the study, the comparative analysis of pre-test and post-test scores revealed that the instructional intervention produced significant improvement in the respondents' writing skills. The t-test results indicated a mean difference of -0.560 ($p = 0.005$), leading to rejection of the null hypothesis. This suggests that the strategies employed during instruction were effective in enhancing students' ability to organize, structure, and express ideas in written form. In contrast, the results for reading comprehension showed no statistically significant difference between pre-test and post-test performance ($p = 0.145$), indicating that the intervention had a limited influence on students' reading outcomes.

Further analysis of the relationship between the extent of teachers' utilization of assistive technology (AT) and learners' post-test literacy performance showed very weak correlations. Specifically, the correlation coefficient for reading comprehension was -0.089 ($p=0.672$), while that for writing skills was 0.051 ($p=0.808$). Both values failed to reach significance at the 0.05 level, leading to the conclusion that the degree of AT use in classroom settings did not significantly influence students' reading or writing performance.

Taken together, the findings indicate that while targeted instructional interventions can effectively improve specific literacy skills such as writing, the extent of assistive technology utilization alone does not guarantee better student outcomes.

These results align with prior studies emphasizing that successful AT integration requires more than mere frequency of use; it depends on purposeful implementation, teacher proficiency, and alignment with instructional goals (Edyburn, 2013; Alnahdi, 2014; Flanagan, Bouck, & Richardson, 2013; Okolo & Bouck, 2017). Therefore, the study underscores the importance of combining evidence-based instructional strategies with thoughtful integration of technology to maximize students' literacy development.

Conclusions

Based on the study, it can be concluded that the instructional intervention effectively enhanced the respondents' writing skills, demonstrating the value of targeted, evidence-based teaching strategies in improving learners' ability to organize and express ideas in written form. In contrast, no significant improvement in reading comprehension was observed, suggesting that additional or alternative instructional approaches may be needed to address challenges in this area. Moreover, the extent of teachers' use of assistive technology showed very weak, non-significant relationships with learners' post-test reading and writing performance, indicating that frequency of use alone does not ensure positive academic outcomes. These findings underscore the importance of integrating assistive technology purposefully and strategically alongside evidence-based instructional practices to optimize students' literacy development.

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