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LEVEL OF LITERACY AND NUMERACY SKILLS OF STUDENTS IN THE ALTERNATIVE LEARNING SYSTEM AT DR. JOSE P. RIZAL SENIOR HIGH SCHOOL:

BASIS FOR A PROPOSED INTERVENTION PLAN

JOHN ROMEL P. ROBLES
Dr. Jose Rizal Senior High School, SDO Dasmariñas City, Cavite, Philippines

EMAIL: roblesjromel@gmail.com

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ABSTRACT

The Alternative Learning System (ALS) at Dr. Jose P. Rizal Senior High School was introduced in 2023, offering Academic and Technical-Vocational-Livelihood tracks. To fill the gap in assessing ALS learners' literacy and numeracy skills, research was conducted involving 65 participants through pre- and post-tests using standardized reading and math assessments. The study employed a descriptive quantitative research design, analyzing data through both descriptive and inferential statistics. Results showed that most learners were females aged 21–30, with varied employment status. All demonstrated at least functional literacy and basic numeracy, while over half reached independent and highly numerate levels. Age and employment positively affected performance. Significant improvements were found in literacy (speed, accuracy, vocabulary, comprehension) and numeracy (number sense, operations, measurement, patterns, algebra), but not in geometry, statistics, and probability. The study concluded that ALS should continue using flexible, learner-centered approaches, provide differentiated instruction, and integrate real-world, work-based learning. It also emphasized the need for improved teaching strategies in the above said subjects, and for regular assessments to ensure foundational skill development among ALS learners.

INTRODUCTION

The Alternative Learning System (ALS) provides non-formal and informal education for learners who cannot access mainstream schooling, including homeschooling, unschooling, and other alternative approaches. ALS at Dr. Jose P. Rizal Senior High School (DJPRSHS) was launched in 2023, offering Academic and Technical-Vocational-Livelihood tracks such as Cooking, Bread and Pastry, Food and Beverage (CBF), and Humanities and Social Sciences (HUMSS). Unlike formal education students, ALS learners at DJPRSHS have not had their literacy and numeracy skills formally assessed since the program began.

DepEd Order 13, s. 2019, and Republic Act No. 11510 (ALS Act) mandate that ALS covers SHS-level education (Grades 11–12) and ensures learners gain competencies for employment, entrepreneurship, TESDA programs, and higher education. According to DepEd (2020) website, this is further supported by the passage of Republic Act No. 11510 (ALS Act) in December 2020, which emphasizes that Accreditation and Equivalency (A&E) Test Elementary level passers are qualified to enroll in Junior High School (JHS); A&E Test JHS level passers are qualified to enroll in Senior High School (SHS) or selected technical vocational education and training programs through the Technical Education and Skills Development Authority (TESDA); and A&E Test SHS level passers are eligible to enroll in technical vocational education and training programs through TESDA or higher education (subject to the requirements set by higher education institutions).

This study aims to evaluate the literacy (reading and comprehension) and numeracy (arithmetic, problem-solving, and basic concepts) skills of ALS students at DJPRSHS, identify strengths and weaknesses, examine how socioeconomic and educational backgrounds influence performance, and analyze the teaching methodologies and instructional materials used to improve these skills. The ultimate goal is to provide strategies for enhancing literacy and numeracy outcomes for ALS learners.

Statement of the Problem

The study aimed to assess the students' literacy and numeracy skills in the Alternative Learning System of Dr. Jose P. Rizal Senior High School.

1. What is the demographic profile of the respondents in terms of:
    1.1. Age
    1.2. Sex
    1.3. Employment status (working or non-working)
2. What is the level of literacy and numeracy skills of ALS students at Dr. Jose P. Rizal Senior High School based on their demographic profile?
3. Are there significant differences in the literacy and numeracy skills of ALS students based on their pre-test and post-test assessments?
4. What proposed intervention plan can be implemented to improve the literacy and numeracy skills of ALS students at Dr. Jose P. Rizal Senior High School?

Methodology

Research Design

The study used a descriptive quantitative design to objectively assess the literacy and numeracy skills of ALS learners at DJPRSHS, providing data for targeted interventions.

Population and Sampling

The study involved 65 ALS learners (School Year 2025–2026), selected via simple random sampling using Slovin's formula to ensure representative diversity in age, background, and learning pace.

Research Locale

Research was conducted at Dr. Jose P. Rizal Senior High School in Dasmariñas City, Cavite, which began its ALS–SHS program in 2023 to support out-of-school youth and adult learners.

Respondents of the Study

ALS learners enrolled in Grades 11–12 were chosen to evaluate literacy and numeracy proficiency and identify learning challenges.

Research Instruments

- Gates-MacGinitie Reading Test (GMRT): Assessed reading comprehension, vocabulary, and fluency (Non-Reader, Frustration, Instructional, Independent levels).
- Key Stage II Numeracy Test: Measured Number Sense, Operations, Measurement, Geometry, Patterns & Algebra, and Statistics & Probability (Non-Numerate, Emergent, Numerate, Highly Numerate).

Data Gathering Procedures

Permission to conduct the study was secured from the **School Principal** and **ALS Coordinator**. Orientation sessions were conducted to explain the study's purpose and secure **informed consent**. Pre-tests and post-tests for literacy and numeracy were administered in two sessions (60–90 minutes each) with the assistance of the ALS facilitator.

Statistical Treatment of Data

Data were analyzed using **descriptive and inferential statistics**:

1. **Frequency and Percentage** – to determine score distributions.
2. **Mean and Standard Deviation** – to measure central tendency and variability.
3. **Slovin's Formula** – to calculate the sample size.
4. **t-test** – to identify significant differences between groups (e.g., age or gender).

Results And Discussion

This chapter presents the results, analysis, and interpretation of the data collected in the study. The researcher organized the data using tables and graphs, each followed by a detailed analysis and interpretation. The tables are arranged in accordance with the research questions or statements of the problem, with each table promptly succeeded by its corresponding analysis, interpretation, and discussion.

PART I: DEMOGRAPHIC PROFILE

Table 1: The Demographic Profile of the ALS-Respondents

1.1 Age	Frequency	Percentage
17-20	13	20.0
21-25	18	27.7
26-30	21	32.3
31-above	13	20.0
N	65	100

A total of 65 ALS learners were assessed, and their ages ranged from 17 to 31 years and above. The largest age bracket, aged 26–30, contains 21 ALS learners or 32.3% of the total. This was followed by the 21–25 age bracket, with 18 ALS learners or 27.7%. Both the 17–20 and 31-above age brackets had 13 learners each, making up 20% of the respondents, respectively.

1.2 Sex	Frequency	Percentage
Male	20	31
Female	45	69
N	65	100

A total of 65 ALS learners were assessed in their Literacy and Numeracy skills through a standardized assessment. Among them, 20 ALS learners, or 31%, were male, while 45 ALS learners, or 69%, were female.

1.3 Employment Status	Frequency	Percentage
Working	34	52.31
Non-working	31	47.69
N	65	100

In terms of employment status, 34 ALS learners (52.31%) are classified as working, while 31 learners (47.69%) are non-working. This indicates a relatively balanced distribution between employed and unemployed learners.

PART II: LEVEL OF LITERACY AND NUMERACY SKILLS OF ALS STUDENTS AT DR. JOSE P. RIZAL SENIOR HIGH SCHOOL BASED ON THEIR DEMOGRAPHIC PROFILE

Table 2: Level of Literacy Skills of ALS Students based on their Demographic Profile

2.1 Age	Frequency	Levels	Percentage
17-20	13	Instructional	47.69
21-25	18	Instructional	
26-30	21	Independent	52.31
31-above	13	Independent	
N	65		100

The study revealed that ALS learners aged 17–25 mostly function at the instructional literacy level, needing guidance to improve reading and comprehension, while learners aged 26 and above generally reach the independent level, capable of self-directed learning. About 52.31% of older learners were independent readers, compared to 47.69% of younger learners at the instructional level, indicating a solid literacy foundation but a need for targeted support for younger participants. These findings align with previous studies (Tambis et al., 2023; Ocampo, 2021; Mangao et al., 2024) showing older learners perform better and are more self-directed, highlighting the importance of age-appropriate literacy interventions that provide structured support for younger learners and advanced opportunities for older learners to sustain growth.

2.2 Sex	Frequency	Levels	Percentage
Male	13	Independent	20
Male	7	Instructional	10.77
Female	21	Independent	32.31
Female	24	Instructional	36.92
N	65		100

The literacy skills of ALS students at Dr. Jose P. Rizal Senior High School show gender-based differences. A higher proportion of males (20%) are independent readers compared to 10.77% at the instructional level, while females have slightly more learners at the instructional level (36.92%) than independent (32.31%). These trends align with research indicating that females often engage more positively in language learning (Caparas et al., 2023) and generally outperform males in reading and writing (Reilly, 2018). Traditional curricula may unintentionally favor one gender (Gambell & Hunter, 1999), highlighting the need for gender-responsive literacy interventions that accommodate the distinct strengths and challenges of both male and female ALS learners.

2.3 Employment Status	Frequency	Levels	Percentage
Working	34	Independent	52.31
Non-working	31	Instructional	47.69
N	65		100

The data indicate that 52.31% of 34 ALS students with varying working statuses are at an independent level, while 47.69% (31 ALS students) are at an instructional level. Notably, 0% of respondents fall into the frustration or non-reader categories. This indicates that all ALS students, regardless of employment status, possess functional literacy skills. Over half can read and comprehend without assistance, while the rest can manage the tasks with some support. These findings are consistent with Ocampo (2021), who found that employment status significantly influences functional literacy, with employed learners performing better in life and career skills. Similarly, Tindowen et al. (2017) observed that employed ALS learners tend to acquire stronger self-management and communication skills, which contribute to their literacy independence. However, Acevedo and Orongan (2025) noted that while employment status does not statistically affect academic performance, employed learners often show slightly better outcomes in portfolio tasks, suggesting a practical advantage in literacy application.

Table 3: Level of Numeracy Skills of ALS Students based on their Demographic Profile

3.1 Age	Frequency	Levels	Percentage
17-20	13	Numerate	47.69
21-25	18	Numerate	
26-30	21	Highly Numerate	52.31
31-above	13	Highly Numerate	
N	65		100

Numeracy test results for ALS learners at Dr. Jose P. Rizal Senior High School show that learners aged 17–25 generally achieved the Numerate level, while those 26 and above reached the Highly Numerate level, indicating skill improvement with age and practical experience. No learners were Non-Numerate or Emergent, demonstrating a solid foundational numeracy. Overall, 47.69% of younger learners were Numerate and 52.31% of older learners Highly Numerate. These findings highlight the need for age-appropriate, contextualized instruction—hands-on activities for younger learners and advanced, real-world tasks for older ones—and support flexible, experience-based numeracy programs that build on existing strengths and promote continued proficiency.

3.2 Sex	Frequency	Levels	Percentage
Male	2	Highly Numerate	3.1
Male	18	Numerate	27.7
Female	32	Highly Numerate	49.2
Female	13	Numerate	20
N	65		100

The numeracy test revealed that female ALS learners outperformed males. Only 3.1% of males were highly numerate compared to 49.2% of females, while 27.7% of males and 20% of females were at the numerate level. Overall, 52.31% of all respondents were highly numerate and 47.69% were numerate, showing a generally strong numeracy foundation. These results align with Velasco and Lomibao (2024), Borgonovi et al. (2018), and Chua (2024), who found that gender influences numeracy outcomes, with females often performing better due to social and educational factors. The findings highlight the need for gender-responsive and differentiated instruction to support all learners and close performance gaps in numeracy.

3.3 Employment Status	Frequency	Levels	Percentage
Working	34	Highly Numerate	52.31
Non-working	31	Numerate	47.69
N	65		100

The numeracy assessment of ALS learners showed that all had at least basic competence, with no one classified as Non-Numerate or Emergent. Among respondents, 47.69% of non-working learners were Numerate, while 52.31% of working learners were Highly Numerate, indicating that employment enhances numeracy through real-world practice. Supporting studies (Gal, 2024; Tindowen et al., 2017; Castillo & Dioso, 2023) emphasize that adult learners benefit from experiential and contextualized instruction. These findings suggest that ALS programs should integrate work-related and practical numeracy activities, especially for non-working learners, to strengthen applied skills and bridge proficiency gaps.

PART III: DIFFERENCES IN THE LITERACY AND NUMERACY SKILLS OF ALS STUDENTS BASED ON THEIR PRE-TEST AND POST-TEST ASSESSMENTS

Table 4: Literacy Skills results of ALS students based on their pre-test and post-test assessments.

4.1 Speed and Accuracy

Descriptive

	N	Mean	Median	SD	SE
Pre-Test Speed and Accuracy	65	21.4	23	4.90	0.607
Post -Test Speed and Accuracy	65	24.9	25	3.07	0.381

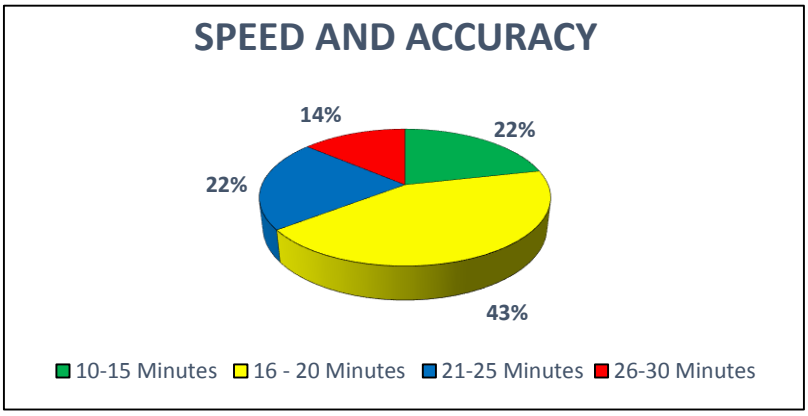
Paired Samples T-Test

			statistic	df	P	Mean difference	SE difference
Pre-Test Speed and Accuracy	Post-Test Speed and Accuracy	Student's t	-8.10	64.0	<.001	-3.43	0.423

The findings reveal a significant improvement in the literacy skills of ALS students, particularly in speed and accuracy, as shown by an increase in mean scores from 21.4 to 24.9 and a statistically significant difference ($t(64) = -8.10$, $p < .001$). This indicates that the intervention effectively enhanced literacy performance. Supporting studies by Romig and Jetton (2023) and Casaup and Robles (2023) confirm that structured and literacy-focused programs lead to notable gains in reading comprehension and performance. Additionally, Alqahtani (2025) highlighted that speed and accuracy are reliable indicators of reading fluency. Overall, the results demonstrate that targeted literacy interventions are effective in strengthening ALS learners' reading speed, accuracy, and overall literacy outcomes.

Figure 2. Speed and Accuracy time intervals

The literacy skills test for ALS students showed that most learners processed tasks efficiently, with 43% completing the assessment in 16–20 minutes. Smaller groups finished in 10–15 minutes (22%) and 21–25 minutes (22%), while 14% took 26–30 minutes, suggesting some need for additional support in fluency and processing speed. Overall, the results indicate that learners possess functional reading skills, and those with strong speed and accuracy are better prepared for real-world reading and writing demands, supporting their academic and personal development.



4.2 Vocabulary

Descriptive

	N	Mean	Median	SD	SE
Pre-Test Vocabulary	65	22.5	23	5.29	0.656
Post-Test Vocabulary	65	28.8	29	1.23	0.152

Paired Samples T-Test

		statistic	df	P	Mean difference	SE difference

4.2 Vocabulary

Descriptive

		N	Mean	Median	SD	SE
Pre-Test Vocabulary	Post-Test Vocabulary	Student's t	-10.1	64.0	<.001	-6.29	0.624

The literacy intervention significantly improved ALS learners' vocabulary, with mean scores rising from 22.5 to 28.8 and a statistically significant difference ($t(64) = -10.6$, $p < .001$). This demonstrates that structured vocabulary instruction enhances word knowledge, comprehension, and consistency in learning outcomes. Supporting research confirms that explicit vocabulary teaching is crucial for literacy development, highlighting its importance within ALS programs for sustained and meaningful improvement.

4.3 Comprehension

Descriptive

	N	Mean	Median	SD	SE
Pre-Test Comprehension	65	22.3	23	5.69	0.705
Post-test Comprehension	65	28.7	29	1.21	0.150

Paired Samples T-Test

			statistic	df	P	Mean difference	SE difference
Pre-Test Comprehension	Post-Test Comprehension	Student's t	-8.89	64.0	<.001	-6.42	0.722

The intervention significantly enhanced ALS learners' comprehension, with mean scores increasing from 22.3 to 28.7 ($t(64) = -8.89$, $p < .001$), demonstrating a measurable positive impact. These results align with prior studies showing that structured, contextualized, and learner-centered literacy programs effectively improve comprehension in ALS settings, confirming the value of targeted literacy interventions.

4.5 Significant Differences of Literacy Skills in terms of Speed and Accuracy, Vocabulary, and Comprehension

LITERACY SKILLS	*t-value*	*p-value*	Mean difference	Decision on H0	Interpretation
Speed and Accuracy	-8.10	< .001	-3.43	reject	significant
Vocabulary	-10.01		-6.29	reject	significant
Comprehension	-8.89		-6.42	reject	significant

The findings show significant differences in the literacy skills of 65 ALS students at Dr. Jose P. Rizal Senior High School across speed and accuracy, vocabulary, and comprehension ($p < .001$), leading to the rejection of the null hypothesis. This confirms that literacy performance varies across these components, aligning with research that links fluency, vocabulary, and comprehension as interdependent skills. The results underscore the need for balanced, structured literacy interventions in ALS programs to support overall reading proficiency.

Table 5: Numeracy Skills results of ALS students based on their pre-test and post-test assessments.

5.1 Number & Number Sense

Descriptive

	N	Mean	Median	SD	SE
Pre-Test Number Sense	65	3.52	4	0.731	0.0907
Post-Test Number Sense	65	4.49	5	0.640	0.0794

Paired Samples T-Test

		statistic	df	P	Mean difference	SE difference

Descriptive

	N	Mean	Median	SD	SE		
Pre-Test Number Sense	Post-Test Number Sense	Student's t	-10.1	64.0	<.001	-0.969	0.0955

The results indicate a significant improvement in ALS students' Number Sense skills after the intervention, with mean scores rising from 3.52 to 4.49 and median scores increasing from 4.00 to 5.00. A paired samples t-test confirmed the improvement was statistically significant ($t(64) = -10.1$, $p < .001$), demonstrating a substantial positive effect. These findings support prior research showing that structured, explicit, and repetitive numeracy instruction enhances problem-solving, quantitative reasoning, and closes learning gaps, underscoring the effectiveness of systematic, evidence-based interventions for strengthening foundational numeracy in ALS programs.

5.2 Number Operations

Descriptive

	N	Mean	Median	SD	SE
Pre-Test Number Operations	65	4.40	5	1.058	0.1312
Post-Test Number Operations	65	4.88	5	0.375	0.0466

Paired Samples T-Test

			statistic	df	P	Mean difference	SE difference
Pre-Test Number Operations	Post-Test Number Operations	Student's t	-4.73	64.0	<.001	-0.477	0.101

The results indicate a significant improvement in the number operations skills of the 65 ALS students following the intervention, with mean scores increasing from 4.40 to 4.88. A paired samples t-test confirmed the improvement was statistically significant ($t(64) = -4.73$, $p < .001$), demonstrating that the intervention effectively enhanced computational abilities. These findings

align with prior research showing that structured, explicit, and consistent mathematics instruction improves fluency, accuracy, and overall numeracy performance, confirming the effectiveness of targeted interventions in strengthening foundational numeracy skills among ALS learners.

5.3 Measurement

Descriptive

	N	Mean	Median	SD	SE
Pre-Test Measurement	65	3.23	3	1.235	0.153
Post-Test Measurement	65	4.26	4	0.815	0.101

Paired Samples T-Test

			statistic	df	p	Mean difference	SE difference
Pre-Test Measurement	Post-Test Measurement	Student's t	-9.05	64.0	<.001	-1.03	0.114

The results indicate a significant improvement in ALS students' measurement skills after the intervention, with mean scores rising from 3.23 to 4.26. A paired samples t-test confirmed the improvement was statistically significant ($t(64) = -9.05$, $p < .001$), demonstrating enhanced performance and greater consistency among learners. These findings align with prior studies showing that targeted, structured, and learner-centered interventions effectively strengthen numeracy skills in alternative learning settings. Overall, the findings affirm that well-designed, learner-centered interventions are effective in closing numeracy gaps and improving measurement competencies among ALS students.

5.4 Geometry

Descriptive

	N	Mean	Median	SD	SE
Pre-Test Geometry	65	2.34	2	1.278	0.1585
Post- Test Geometry	65	2.32	2	0.773	0.0958

Paired Samples T-Test

Descriptive

	N	Mean	Median	SD	SE		
			statistic	df	P	Mean difference	SE difference
Pre-Test Geometry	Post- Test Geometry	Student's t	0.127	64.0	0.899	0.0154	0.121

The results indicate no significant improvement in ALS students' geometry scores, with pre-test and post-test means nearly unchanged (2.34 vs. 2.32) and a paired samples t-test showing no statistical significance ($t(64) = 0.127$, $p = 0.899$). This suggests the intervention did not impact geometry performance, highlighting that abstract mathematical concepts like geometry require specialized, multimodal, and learner-centered instructional strategies—such as visual, tactile, or technology-enhanced methods—to effectively develop spatial reasoning and conceptual understanding in ALS learners.

5.5 Pattern and Algebra

Descriptive

	N	Mean	Median	SD	SE
Pre-Test Pattern and Algebra	65	2.98	3	1.386	0.1719
Post-Test Pattern and Algebra	65	4.22	4	0.800	0.0993

Paired Samples T-Test

			statistic	df	P	Mean difference	SE difference
Pre-Test Pattern and Algebra	Pre-Test Pattern and Algebra	Student's t	-10.7	64.0	<.001	-1.23	0.116

The results indicate a significant improvement in ALS students' Pattern and Algebra skills, with mean scores rising from 2.98 (SD = 1.386) in the pre-test to 4.22 (SD = 0.800) in the post-test. A paired samples t-test confirmed the difference was statistically significant ($t(64) = -10.7$, $p < .001$), demonstrating that the intervention effectively enhanced numeracy, particularly in algebraic reasoning and pattern recognition. These findings align with research showing that targeted, project-based, and contextualized math instruction boosts both mathematical proficiency and learner confidence, supporting the development of higher-order problem-solving skills.

5.6 Statistics and Probability

Descriptive

	N	Mean	Median	SD	SE
Pre-Test Statistics and Probability	65	2.69	3	1.41	0.175
Post-Test Statistics and Probability	65	2.63	2	1.13	0.140

Paired Samples T-Test

			statistic	df	P	Mean difference	SE difference
Pre-Test Statistics and Probability	Post-Test Statistics and Probability	Student's t	0.497	64.0	0.621	0.0615	0.124

The findings indicate no significant improvement in ALS learners' Statistics and Probability skills, with mean scores slightly decreasing from 2.69 (SD = 1.41) in the pre-test to 2.63 (SD = 1.13) in the post-test ($t(64) = 0.497$, $p = .621$). This negligible change suggests that the intervention had little effect in this area, consistent with research showing that numeracy gains are limited when instruction lacks intensity, explicit focus, or contextual relevance. The results highlight the need for sustained, structured, and context-sensitive approaches to effectively enhance Statistics and Probability skills among ALS learners.

5.7 Significant Difference of Numeracy Skills in Terms of Number and Number Sense, Number Operations, Measurement, Geometry, Pattern and Algebra, Statistics and Probability

NUMERACY SKILLS	*t-value*	*p-value*	Mean difference	Decision on H0	Interpretation
Number and Number Sense	-10.01	< .001	-0.969	*Reject*	*significant*
Number Operations	-4.73		-0.477	*Reject*	*significant*
Measurement	-9.05		-1.03	*Reject*	*significant*
Geometry	0.127	0.899	0.0154	*not reject*	*not significant*
Pattern and Algebra	-10.7	< .001	-1.23	*Reject*	*significant*
Statistics and Probability	0.497	0.621	0.0615	*not reject*	*not significant*

The analysis of 65 ALS students' numeracy skills showed significant gains in Number and Number Sense, Number Operations, Measurement, and Pattern and Algebra ($p < .001$), while Geometry and Statistics & Probability showed no meaningful improvement ($p = .899$ and .621). These results reflect patterns observed in prior research, where interventions more readily enhance number-related skills, but abstract areas like Geometry and Statistics & Probability require explicit, visual, and concept-focused instruction. Overall, the findings suggest that while the intervention strengthened foundational numeracy, future ALS programs should include targeted, domain-specific strategies to address persistent challenges in Geometry and Statistics & Probability.

Conclusions

ALS serves a diverse age group, mainly adults in their late twenties, with a gender imbalance and mixed employment status, highlighting the need for flexible, skill-focused programs. Learners generally have functional literacy, with older and employed learners performing more independently. Targeted, age- and gender-sensitive instruction is needed to address gaps. ALS learners show a solid numeracy foundation, though younger learners require more support. Females generally perform better, and employment enhances numeracy, suggesting real-world tasks can improve skills. The intervention significantly improved speed, accuracy, vocabulary, and comprehension. Significant gains occurred in Number Sense, Number Operations, Measurement, and Pattern & Algebra, but not in Geometry or Statistics & Probability, indicating a need for targeted strategies in these areas. The intervention effectively improved most literacy and numeracy skills, but Geometry and Statistics & Probability require additional focus. Future ALS programs should use flexible, learner-centered, and context-based strategies to address specific gaps and support diverse learners.

Recommendations

1. For ALS Students: Attend regularly, practice literacy and numeracy outside class, apply skills in real life, and collaborate with peers.

2. For ALS Teachers: Differentiate lessons, provide extra support for younger/non-working learners, use practical and hands-on approaches, and focus on Geometry and Statistics/Probability.

3. For Parents/Guardians: Ensure attendance, provide study support at home, and celebrate learners' achievements.

4. For Administrators/Policymakers: Improve curriculum for weak areas, train teachers in differentiated instruction, provide flexible schedules and adequate resources, and create real-world learning opportunities.

5. For Future Researchers: Study long-term skill retention, explore factors influencing progress, replicate with larger samples, and test innovative teaching strategies.

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