An Assessment on 3Rs (Reading, Writing, Arithmetic) Skills among Elementary Pupils in Lanao del Sur I

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ABSTRACT

This study conducted a comprehensive evaluation of Grade 3 to 6 pupils' proficiency in foundational skills of Reading, Writing, and Arithmetic (3Rs) within the Lanao del Sur I Division, using a descriptive quantitative research design. A rigorously validated 3Rs Diagnostic Assessment Tool was employed to identify learning gaps that have widened due to the COVID-19 pandemic. The assessment, which highlighted significant deficiencies particularly in reading comprehension, creative writing, and arithmetic word problem-solving, revealed a critical need for targeted curriculum enhancements. Inferential statistical methods, including t-tests and ANOVA, were used to analyze performance variances across grade levels and gender, uncovering both statistically significant improvements and areas of stagnation. To address these gaps, the study proposes a follow-up intervention plan focused on learner-centered, culturally responsive teaching practices, supported by teacher training in evidence-based strategies. This nuanced approach aims to align local educational efforts with UNESCO's Education 2030 framework, enhancing equitable access to quality education and fostering robust academic performance across the student body.

Keywords: Learning gaps, 3Rs skills, reading comprehension, creative writing, word problem-solving, inferential statistics, curriculum development

INTRODUCTION

The 3Rs—Reading, Writing, and Arithmetic—are the pillars of foundational education. In underserved regions such as Lanao del Sur I, where educational disparities are amplified by socioeconomic barriers and limited infrastructure, the mastery of these core skills is vital. This study investigates the specific learning gaps among elementary pupils in these domains. Grounded in the understanding that these skills are interrelated, the study uses diagnostic assessments to quantify students' proficiency and identify weak points that hinder academic growth. The findings provide the empirical basis for a responsive and inclusive curriculum designed to close these gaps and support learners' success.

This assessment evaluates students' performance in reading, arithmetic, and writing, highlighting areas of skills in reading (fluency, vocabulary, and comprehension), writing (structure, spelling, and creative writing), and arithmetic (foundational number sense, basic operations, and word problem-solving) that exhibit the most significant learning gaps among students.

The findings of this study align with the global educational objectives outlined by UNESCO's Education 2030 Agenda, which emphasizes the need for inclusive and equitable quality education and promoting lifelong learning opportunities for all. Specifically, the study underscores the necessity to improve foundational literacy and numeracy skills as part of Sustainable Development Goal 4 (SDG 4), which aims to ensure that all young people achieve literacy and numeracy.

In the local context, the educational policies in Lanao del Sur focus on reducing educational disparities exacerbated by socioeconomic challenges and structural barriers. The results of this assessment highlight critical areas where local policies can intervene to support underserved communities. By providing equitable access to

educational resources and prioritizing teacher training in evidence-based instructional strategies, Lanao del Sur's educational framework can be strengthened to better align with the goals of Education 2030

METHODOLOGY

This research employed a descriptive quantitative design to evaluate proficiency levels in foundational academic skills—specifically Reading, Writing, and Arithmetic (3Rs)—among elementary pupils. The study was conducted among 381 elementary school students from public schools in the Lanao del Sur I Division. This diverse sample includes students from Grades 1 to 6, ensuring a broad representation of proficiency levels in foundational skills. The student population consisted of 48% male and 52% female, reflecting a balanced gender representation across the sample..The region of Lanao del Sur I presents diverse socioeconomic backgrounds, which significantly influence educational outcomes. The community primarily consists of lower to middle-income families, where educational opportunities and resources may vary significantly. This socioeconomic context underscores the challenges and disparities in educational access, impacting learners' proficiency levels in the 3Rs. The schools involved offer varied cultural and educational experiences, emphasizing the need for culturally responsive teaching practices. In this setting, the mix of urban and rural schools presents a spectrum of learning environments, from those with adequate resources to under-resourced settings that face infrastructural challenges. These environmental differences provide important contextual background for interpreting the assessment results and for planning targeted interventions.

This study aimed to identify educational gaps that have widened due to disruptions from the COVID-19 pandemic and to inform curriculum enhancement strategies. Participants were drawn from selected public schools in the Lanao del Sur I Division, employing stratified random sampling to ensure balanced representation across different grade levels and classroom sections. In total, 381 students participated in the assessments.

Instruments Validation

The study utilized a teacher-developed 3Rs Diagnostic Assessment Tool to measure student proficiency across key areas: reading comprehension, basic writing mechanics, and arithmetic operations. This tool was categorized into three sections:

- **Reading Assessment:** Comprised short passages and accompanying multiple-choice and brief-response questions to evaluate vocabulary, inferencing abilities, and literal comprehension.
- **Writing Assessment:** Emphasized sentence construction, accurate punctuation, and paragraph coherence with prompts grounded in local and cultural contexts familiar to the students.
- **Arithmetic Assessment:** Assessed mastery of fundamental operations (addition, subtraction, multiplication, and division), understanding of place value, and skills in solving word problems.

For validity and reliability, the assessment tool was extensively reviewed by a panel of educational professionals. It was subsequently pilot-tested with a different cohort of students to ensure it met curriculum standards and accurately measured intended competencies. The reliability of the assessment instrument was quantified using Cronbach's alpha, which provided a coefficient of 0.85. This high value indicates strong internal consistency across the test components, affirming the tool's suitability for accurately assessing the 3Rs skills among the target student population.

Data Collection and Analysis

The study employed a teacher-designed 3Rs Diagnostic Assessment Tool to assess foundational skills (Reading, Writing, Arithmetic) among Grade 3 to 6 pupils in public schools in Lanao del Sur I Division. The tool was administered under controlled conditions in classrooms, facilitated by trained educators to maintain consistency and reliability. The data collection took place during scheduled sessions, with the aim of identifying proficiency gaps affected by the COVID-19 pandemic, and to guide enhancements in the educational curriculum.

Data Analysis:

The collected data underwent a comprehensive analysis using both descriptive and inferential statistical methods:

- **Descriptive Statistics:** Initial analysis involved computing the mean scores and standard deviations for each skill area to establish a baseline understanding of student performance. These metrics offered insight into the overall proficiency levels and variance among students.

- **Inferential Statistics:**

    - **T-tests** were conducted to examine differences in performance across grade levels and gender groups. This involved analyzing mean differences in reading comprehension, creative writing, and problem-solving skills between specified groups.

    - **Analysis of Variance (ANOVA)** was utilized to assess differences across all grade levels simultaneously, offering a broader view of where significant disparities in skill development exist.

    - **Results Interpretation:**

        - The analysis noted statistically significant improvements in reading comprehension and word problem-solving skills between certain grade transitions, highlighting effective stages of instructional methods. However, some transitions displayed non-significant differences, indicating areas requiring further pedagogical focus.

        - Gender comparisons revealed that female students generally outperformed male students in both reading comprehension and creative writing, suggesting a need for gender-targeted interventions.

These statistical methods provided a detailed characterization of the student body's learning status, informing targeted educational strategies designed to address identified learning gaps and improve curriculum efficacy. By integrating both descriptive and inferential statistics, the analysis offers a comprehensive overview necessary for thoughtfully enhancing educational practices within the region.

RESULTS/FINDINGS

A. Skills in 3Rs that exhibit the learning gaps among students

Assessment Reading	Mean (*n*=381)	Std. Deviation	Qualitative Description
Fluency	3.468	1.405	Average
Vocabulary	3.858	0.826	Average
Comprehension	2.847	1.339	Below Average
Arithmetic			
Foundational Number Sense	3.589	1.169	Average
Basic Operation	3.792	0.756	Average
Word Problems	2.897	1.098	Below Average
Writing			
Structure	3.426	1.036	Average
Spelling	3.568	1.039	Average
Creative Writing	2.650	1.277	Below Average

Ranges:

0.00-1.0 =Very Poor, 1.1-2.0= Poor, 2.1-3.0= Below Average, 3.1-4.0= Average, 4.1-5.0= Excellent

The table reveals key learning gaps in the foundational reading, writing, and arithmetic skills among students, shedding light on areas requiring targeted interventions. Each skill area was evaluated based on specific sub-skills, providing a nuanced understanding of student performance.

DISCUSSION

Reading Skills

The reading assessment revealed vocabulary (3.858, "average") as the strongest sub-skill, followed by fluency (3.468, "average"). However, comprehension scored the lowest (2.847, "below average"), revealing a substantial learning gap in understanding and interpreting a text. This aligns with Pretorius and Currin (2019), who emphasized that many learners, especially in under-resourced settings, can decode words but struggle to derive meaning from texts. Poor comprehension skills can be attributed to limited exposure to varied reading materials and insufficient practice with critical thinking tasks, such as making inferences and analyzing context.

The learning gap in reading comprehension has broader implications. This suggests that students struggle to engage deeply with texts, limiting their ability to derive meaning, critically analyze, and synthesize information. Without strong comprehension, students cannot fully engage with other subjects, limiting their ability to learn from written instructions or analyze problems in arithmetic and writing. A study by Duke et al. (2018) found that students who struggle with comprehension tend to have difficulties in higher-order thinking, including making inferences and understanding complex texts. Educators should implement explicit comprehension strategies such as question-answering, summarizing, and text discussion to bridge this gap. Additionally, classroom interventions like guided reading sessions, peer reading, and the use of diverse and contextually relevant texts can enhance reading comprehension (Aladro, 2021). Policymakers must prioritize equitable access to books and literacy resources to ensure students in rural or marginalized areas are not left behind.

Arithmetic Skills

Arithmetic showed notable strengths in basic operations (3.792, "average") and foundational number sense (3.589, "average"), suggesting that students possess a reasonable grasp of arithmetic fundamentals. However, word problems scored the lowest (2.897, "below average"), indicating a significant gap in students' ability to apply mathematical concepts to practical situations. This aligns with Siegler et al. (2020), who argue that problem-solving is a complex skill requiring both procedural fluency and critical reasoning.

The gap in solving word problems likely stems from limited classroom exposure to real-world math applications. Indicating difficulty in applying theoretical knowledge to practical, real-world scenarios, requiring stronger integration of critical thinking and math literacy. Students may be unable to decode problem scenarios, relate them to mathematical operations, and construct logical solutions. Research by Van de Rijt and Van Groenestijn (2017) shows that students who struggle with word problems have gaps in applying math concepts to real-life scenarios. This skill is particularly critical as it forms the basis for applied mathematics in higher education and real-life contexts such as budgeting or measurements. To address this, educators should integrate word problems into daily lessons and use collaborative learning strategies like group problem-solving and discussion. Policymakers should support teacher training initiatives focused on applied and contextualized mathematics education.

Writing Skills

The writing assessment revealed average performance in spelling (3.568) and structure (3.426), while creative writing (2.650, "below average") showed the largest gap. These results align with Graham and Harris (2019), who found that creative writing requires higher-order thinking skills like planning, organizing, and elaborating, which many students struggle to develop due to limited exposure to imaginative writing tasks.

The gap in creative writing stresses a lack of opportunities for students to express their thoughts and ideas freely. This points out a lack of imagination and originality in expressing ideas, compounded by limited opportunities for self-expression and exploration of narrative forms. This affects not only their writing skills but also their

ability to think critically and innovatively. Research by Tan and Tan (2021) emphasized the importance of fostering creativity in writing through student-centered activities, which significantly enhance engagement, critical thinking, and overall writing output. Similarly, the Organisation for Economic Co-operation and Development (OECD, 2019) found that integrating creative and critical thinking into classroom practices leads to more engaged learners and better academic outcomes. This implies that teachers should encourage creative writing tasks like storytelling, journaling, and narrative exercises to foster students' creativity and confidence. Teachers must design lessons that include creative writing activities, such as storytelling, journal writing, and poetry, to foster imagination and expression. Additionally, students should be given constructive feedback to build their confidence and skills in this area. Curricular reforms should ensure that creative writing is given equal importance alongside technical writing skills.

The implications of the gaps in the 3Rs (reading, writing, arithmetic) are interdependent rather than isolated. For example, poor reading comprehension affects students' ability to solve word problems in mathematics, as they struggle to decode and understand problem statements (Pretorius and Currin, 2019). Similarly, weak creative writing skills hinder their capacity to articulate and explain mathematical solutions, which is a crucial skill for problem-solving and higher-order thinking (Graham et al. 2019). Addressing these interconnected gaps is essential to ensure holistic learning and lifelong success for students.

To address these gaps, interventions must be learner-centered and culturally responsive. Providing contextually relevant reading materials in students' native language, for instance, has been shown to improve both comprehension and engagement (Ball, 2010). Additionally, integrating technology into teaching practices can help bridge learning gaps effectively. Gamified platforms for math, such as adaptive learning tools, have been proven to increase motivation and improve foundational arithmetic skills (Siegler et al., 2020). Similarly, interactive storytelling tools enhance creative writing by engaging students in meaningful and culturally relevant contexts (Jesson & Parr, 2019).

Furthermore, the overall assessment of learning gaps in the 3Rs reveals that reading skills showed the largest gap as ranked 1, indicating significant challenges in students' ability to understand, analyze, and interpret texts. The gaps identified in reading comprehension represent critical areas that need targeted interventions.

Finally, teacher professional development must be prioritized to ensure the implementation of evidence-based instructional strategies. Research shows that equipping teachers with targeted training to address specific gaps—such as comprehension strategies for reading or scaffolding techniques for creative writing—significantly improves student outcomes (Desimone & Garet, 2015).

B. Test Scores/Results of 3Rs exhibiting learning gaps among students

Table 2: T-Test Results for Reading Comprehension Scores

Group Comparison	Mean Difference	Standard Deviation	Standard Error	t-value	p-value
Grade 3 vs. Grade 4	1.23	1.34	0.19	6.47	< 0.01
Grade 4 vs. Grade 5	0.39	1.30	0.17	2.29	0.03
Grade 5 vs. Grade 6	0.26	1.25	0.15	1.73	0.09
Male vs. Female Students	0.87	1.29	0.18	4.83	< 0.05

Legends:

- *Mean Difference: Reflects the average score difference between the groups.*
- *Standard Deviation (SD): Shows the variability of scores within groups.*
- *Standard Error (SE): Provides an estimation of the accuracy of the mean difference.*
- *t-value and p-value: These indicators reflect the significance of group differences. A p-value less than 0.05 typically denotes statistical significance.*

The table reveals significant insights into the differences between the specified groups. Each comparison provides valuable data regarding the effectiveness of existing educational interventions and areas needing further focus.

Grade 3 vs. Grade 4: The t-test revealed a mean difference of 1.23 between Grades 3 and 4, with a standard deviation of 1.34 and a standard error of 0.19. The t-value of 6.47 and a p-value less than 0.01 suggest a statistically significant improvement in reading comprehension from Grade 3 to Grade 4, indicating that students demonstrate considerable growth in this academic skill as they progress.

Grade 4 vs. Grade 5: This analysis yielded a mean difference of 0.39, with a standard deviation of 1.30 and a standard error of 0.17. The t-value of 2.29 and a p-value of 0.03 indicate a statistically significant difference between these grades' mean scores. This suggests that while improvements are significant, the learning curve might be flattening compared to the previous transition, potentially highlighting areas for targeted instructional focus.

Grade 5 vs. Grade 6: The t-test results show a mean difference of 0.26 with a standard deviation of 1.25 and a standard error of 0.15. The t-value of 1.73 corresponds to a p-value of 0.09, which is above the conventional threshold of 0.05, indicating no statistically significant difference between these two grades' scores. This finding suggests a potential plateau in reading comprehension gains, necessitating further investigation into teaching methods or curriculum content to reignite student progression.

Male vs. Female Students: The analysis shows a mean difference of 0.87, with a standard deviation of 1.29 and a standard error of 0.18. The t-value of 4.83 and a p-value less than 0.05 highlight a statistically significant difference, suggesting that gender may play a role in reading comprehension proficiency, with female students outperforming male counterparts in this sample. These results can inform gender-focused instructional strategies to support all students effectively.

Thus, the t-test analyses underscore critical areas for intervention, focusing on the transitions between specific grades and potential gender differences in proficiency, providing a foundation for subsequent educational strategies and curricular developments. This analysis interprets the statistical findings and suggests implications for educational practice, helping to contextualize the data meaningfully.

Table 3: T-Test Results for Word Problem Solving Scores

Group Comparison	Mean Difference	Standard Deviation	Standard Error	t-value	p-value
Grade 3 vs. Grade 4	1.10	1.25	0.18	6.11	< 0.01
Grade 4 vs. Grade 5	0.30	1.20	0.16	1.88	0.06
Grade 5 vs. Grade 6	0.20	1.15	0.14	1.43	0.15
Male vs. Female Students	0.70	1.22	0.17	4.12	< 0.05

Legends:

- ***Mean Difference:*** *Reflects the average score difference between the groups.*
- ***Standard Deviation (SD):*** *Shows the variability of scores within groups.*
- ***Standard Error (SE):*** *Provides an estimation of the accuracy of the mean difference.*
- ***t-value and p-value:*** *These indicators reflect the significance of group differences. A p-value less than 0.05 typically denotes statistical significance.*

The Table reveals important findings about student performance across different grade levels and between genders:

Grade 3 vs. Grade 4: A statistically significant mean difference of 1.10 indicates strong improvement in problem-solving skills as students advance from Grade 3 to Grade 4, supported by a t-value of 6.11 and a p-value

less than 0.01. This suggests that the educational interventions in place between these grades effectively bolster problem-solving abilities.

Grade 4 vs. Grade 5: The mean difference of 0.30 is not statistically significant (p = 0.06), suggesting a plateau in gains between these grades. This might indicate the need for enhanced instructional strategies to sustain progress in problem-solving skills during this transition.

Grade 5 vs. Grade 6: A mean difference of 0.20 shows very modest gains, with a lack of statistical significance (p = 0.15). This further suggests that upper-grade curricula might require a focused review and adaptation to address stagnation in skill development.

Male vs. Female Students: The significant difference between genders, with females scoring higher (mean difference of 0.70, p < 0.05), highlights potential gender-based disparities in problem-solving competency. This may call for targeted support to uplift male students' performance.

Table 4: T-Test Results for Creative Writing Scores

Group Comparison	Mean Difference	Standard Deviation	Standard Error	t-value	p-value
Grade 3 vs. Grade 4	0.95	1.20	0.17	5.59	< 0.01
Grade 4 vs. Grade 5	0.25	1.18	0.15	1.67	0.10
Grade 5 vs. Grade 6	0.15	1.10	0.13	1.15	0.25
Male vs. Female Students	0.80	1.15	0.16	5.00	< 0.05

Legends:

- ***Mean Difference:*** *Reflects the average score difference between the groups.*
- ***Standard Deviation (SD):*** *Shows the variability of scores within groups.*
- ***Standard Error (SE):*** *Provides an estimation of the accuracy of the mean difference.*
- ***t-value and p-value:*** *These indicators reflect the significance of group differences. A p-value less than 0.05 typically denotes statistical significance.*

The table provides similar insights into the evolving capabilities of students across different grades and gender comparisons:

Grade 3 vs. Grade 4: The almost 1-point improvement (mean difference of 0.95) indicates a positive shift in creative writing skills from Grade 3 to Grade 4. With a t-value of 5.59 and a p-value less than 0.01, the results reflect the effectiveness of instructional practices in enhancing students' writing abilities.

Grade 4 vs. Grade 5: A modest mean difference of 0.25 is observed with no statistical significance (p = 0.10). This outcome suggests that innovative teaching methods are needed to maintain the momentum of creative writing development in this grade transition.

Grade 5 vs. Grade 6: The mean difference of 0.15 does not reach statistical significance (p = 0.25), indicating minimal skill gains. Curriculum adjustments may be necessary to address potential challenges in promoting advanced creative writing skills among senior students.

Male vs. Female Students: Female students demonstrated statistically significant higher performance in creative writing, with a mean difference of 0.80 (p < 0.05). Such findings emphasize the necessity for gender-sensitive pedagogical approaches to close the performance gap and encourage improvement among male students.

These analyses provide insights into the areas of educational focus and opportunities for enhancement, supporting the formulation of targeted interventions to bolster student proficiency in problem-solving and creative writing

CONCLUSION

The assessment revealed significant gaps in comprehension, creative writing, and mathematical word problem-solving, despite average performance in basic reading, spelling, and arithmetic operations. These findings highlight the need for integrated, skill-specific interventions that enhance both cognitive and expressive abilities. The interdependence of the 3Rs suggests that failure in one domain can impair progress in others, stressing the importance of a balanced, well-aligned curriculum. Addressing these learning gaps is not only a matter of academic performance but also equity and access to quality education for all learners.

Proposed Intervention Plan

In response to the identified proficiency gaps among elementary pupils in the foundational skills of Reading, Writing, and Arithmetic (3Rs), an intervention plan has been proposed to enhance curriculum effectiveness and student learning outcomes in Lanao del Sur. Recognizing the unique educational challenges exacerbated by the COVID-19 pandemic, this intervention aims to bolster student competence through targeted strategies that emphasize skill development, teacher training, and resource optimization. The plan outlines a phased approach that integrates culturally responsive teaching methods and innovative pedagogical practices to create an inclusive, supportive learning environment. Through these focused efforts, the intervention seeks to uplift educational standards and bridge learning gaps, ensuring students are equipped with the essential skills necessary for academic success.

Objective: To enhance comprehension, creative writing, and problem-solving skills among elementary pupils in Lanao del Sur I, addressing the identified learning gaps through a structured, skill-specific intervention.

1. **Phase I: Curriculum Development**
    - Integrate creative and contextual learning strategies targeting the weakest areas: reading comprehension, creative writing, and word problems in arithmetic.
    - Employ a culturally responsive curriculum that includes diverse and relevant reading materials to improve engagement and comprehension.
2. **Phase II: Teacher Training**
    - Conduct workshops for teachers focusing on innovative teaching strategies and the integration of technology in classroom instruction. Emphasize training in comprehension strategies, creative writing instruction, and contextualized math teaching.
3. **Phase III: Implementation and Support**
    - Pilot the new curriculum in a select number of schools, with ongoing support through peer collaboration and access to expert feedback.
    - Use formative assessments to monitor progress and customize instruction, providing real-time feedback to educators and policymakers.
4. **Phase IV: Evaluation and Scaling**
    - Conduct evaluations at the end of the academic term to assess the effectiveness of the interventions.
    - Based on evaluation results, scale successful teaching practices and curriculum components across the district, ensuring widespread improvement.

These phases aim to provide a comprehensive response to the educational needs revealed by the assessment, combining policy, practice, and professional development to foster an environment conducive to learning and growth.

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