



# INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

## EFFECT OF EXPLICIT TEACHING INTERVENTION ON BASIC ARITHMETIC SKILLS OF GRADE TWO STUDENTS WITH MATHEMATICS LEARNING DIFFICULTIES IN DUKEM CITY, OROMIA, ETHIOPIA

Getnet Begna<sup>1</sup>, Dawit Negassa<sup>2</sup>, Pavan Kumar Yadavalli<sup>3</sup>

<sup>1</sup>Special Needs & Inclusive Education Department, Ambo University, Ethiopia

<sup>2</sup>Special Needs & Inclusive Education Department, Haramaya University, Ethiopia

<sup>3</sup>Department of Teacher Education, Manipur University (A Central University), Imphal, India.

Corresponding author: Getnet Begna

### Abstract

This study evaluated the effectiveness of an explicit teaching intervention on the basic addition and subtraction performance of grade two students with mathematics learning difficulties in Dekem Primary Schools, Oromia Ethiopia. A quasi-experimental pretest-post-test control group design was employed with 90 students identified through low Basic Numerical and Calculation Ability scores. The 20-week intervention implemented a structured explicit teaching grounded in the Concert-Representation-Abstract instructional sequence. Achievement was assessed through standardized pretest and posttest measures of addition and subtraction. Findings showed significant gains for the intervention group, with mean improvement of 5.6 points in addition and 5.5 points in subtraction compared with control group, indicating a subtraction effect of explicit teaching intervention on basic arithmetic skills. The results support the efficacy of systemic, scaffolded teaching methods for students experiencing mathematics learning difficulties. The study recommends incorporating explicit teaching approaches into routine mathematics teaching and strengthening teacher professional development focused on evidence-based practice. Further investigation of context-responsive interventions that reflect the socio-cultural realities of Ethiopian classrooms also advised. Such efforts have the potential to enhance core mathematical skills and contribute to improved academic outcomes for students with mathematics learning difficulties.

**Keywords:** Concert-Representational-Abstract (CRA) framework, basic arithmetic skills, explicit teaching intervention, mathematics learning difficulties.

## Introduction

### 1.1. Background of the Study

Basic arithmetic skills, particularly addition and subtraction, form the foundation for mathematical competence and overall academic success (Ayalew, 2019). The early primary grades (1-4) are critical for developing these core skills, yet many students struggle to master them (Tefera, 2021). Learning difficulties in basic arithmetic hinder progression in later mathematics, affects learning trajectories overall, and can limit students' confidence and engagement. Beyond academics, these challenges may also constrain students' ability to participate fully in civic and community life. These issues highlight the importance of early identification of at-risk learners and the implementation of targeted instructional strategies to establish strong mathematical foundation during these formative years.

Research indicated that mathematics learning difficulties (MLDs) are prevalent among primary school student in Ethiopia. Tesfaye & Mekonen (2020) reported that approximately 30% of young learners lack proficiency in basic arithmetic skills, particularly addition and subtraction, which constrains their progression in mathematics. MLDs manifest in various forms including difficulties in retrieving arithmetic facts, solving mathematical problems, and diminished engagement with mathematical tasks (Zakariya, 2021). These challenges highlight the need for targeted instructional approaches to support the development of foundational arithmetic competencies.

Recent assessments in Dukem City show that primary schools' students in early grades struggle significantly with basic arithmetic skills, particularly addition and subtraction. Asfaw (2023) reported that many students experience mathematics anxiety, which impedes both engagement and achievement. Early interventions for grades 1-4 students with mathematics learning difficulties (MDs) are crucial to prevent further learning gaps. Equipping teachers with skills to identify and support at-risk students before they fall behind has been highlighted as an effective strategy (Tiruneh, 2023). Implementing these approaches can reduce inequalities in education outcomes and improve overall performance in mathematics by strengthening foundational arithmetic skills.

### 1.2.Statement of the Problem

Basic arithmetic skills, particularly addition and subtraction, are essential for everyday functioning and are fundamental to both individual and societal well-being (Handson et al., 2021; Seitz & Weinert, 2022; Tout2020b). These foundation competences are widely recognized as critical components of school curricula across educational systems worldwide. As core elements of early mathematics

instruction addition and subtraction are among the most universally taught skills and serve as basis for more advanced mathematical learning (Mulcahy et al., 2019) & Outhwaite et al., 2019). Given their central importance, it is imperative that all students are provided with adequate opportunities and instructional support to develop a deep and conceptual understanding of these skills. Mastery of basic arithmetic, particularly addition and subtraction, is not only vital for academic success but also serves as a key indicator of educational achievement in Ethiopia and globally.

Despite the recognized importance of basic arithmetic skills, particularly addition and subtraction, students' performance in mathematics remains persistently low across educational level in Ethiopia. National Learning Assessments (NLAs), conducted in four-year cycles at grades 4 & 8, have consistently revealed that mean mathematics scores remain below 50% minimum standard set by the Ministry of Education, as evidenced in six consecutive assessments from 2000-2019 (Rolleston et al., 2021). Notably, the sixth NLA conducted in 2019 reported that 68.79% of grade 4 students and 90.1% of grade 8 students scored below 50% in mathematics (Rolleston et al., 2021). In addition, Early Grade Mathematics Assessment (EGMA), implemented since 2017 to evaluate foundational skills among grades 2 and 3 students, particularly in basic arithmetic skills such as addition and subtraction, has identified substantial learning gaps (Awgichew, 2021). Findings indicate that 79.3% of grade 2 students did not achieve minimum proficiency in addition, and 84.8 % did not demonstrate the minimum proficiency in subtraction, suggesting that a large population of students lack the foundational skills necessary for academic progression. However, these low performing students are promoted to next grade levels without mastering essential competencies, thereby compounding learning difficulties over time (Multu, 2019 & Seage & Türegün, 2020). This situation is particularly concerning given that the early grades (1&2) are intended to establish fundamental numeracy skills, including basic addition and subtraction; failure to do so contributes to continued poor performance in national assessments and later academic stages (Awgichew, 2021).

Although the prevalence of reading difficulties and mathematics learning difficulties appears to be comparable, research efforts have not reflected this equivalence (Aunio et al., 2021 & Grigorenko et al., 2020). Considerably more research has been conducted in the dominating of reading, whereas mathematics education remains underexplored. Similarly, in Ethiopia, limited attention has been given to learning disabilities in mathematics. While international interest in MLD has increased over the past decade, this trend has yet to be mirrored locally. To date, only a few undergraduate theses and two postgraduate dissertations (one master's & one Ph.D.) have conducted on MLDs in Ethiopia (Ayalew, 2019, Mekonnen, 2022 and Muzemil, 2018). These studies primary focused on factors contributing to MLDs, teachers' awareness of MLDs, the self-concept of children of children with MLDs, and early

numerical intervention utilizing the Ethiopia Gobat's to enhance the achievement and motivation of students with MLDs. Notably, significant research gaps remain in the area of effective teaching methods, assessment practices and individualized interventions for students with MLDs. The present study seeks to address this gap by implementing explicit teaching strategy intervention aimed at improving early basic arithmetic skills focusing on addition and subtraction among grade two students with mathematics learning difficulties. The present study seeks to address this gap by implementing an explicit teaching intervention aimed at improving early basic addition skills among Grade 2 students with MLD.

Accordingly, this study was conducted to examine the effect of an explicit teaching intervention focusing on early basic arithmetic skills (addition and subtraction) among grade 2 students with mathematics learning difficulties in four government primary schools in Dukem city, Oromia, Ethiopia. The intervention targeted these skills both with and without explicit instruction to evaluate its effectiveness. A group-based pre-test-post-test control design was employed; with student performance measured using BANUCA and pre-test scores to comprehensively identify learning gaps and baseline competencies.

### 1.3. Research Hypotheses

The study aimed at testing the following hypotheses.

**H<sub>1</sub>:** There is a significant difference in basic arithmetic skills performance between grade two students with mathematics learning difficulties who receive an explicit teaching intervention and those who do not.

**H<sub>01</sub>:** There is no significant difference in basic arithmetic skills performance between grade two students with mathematics learning difficulties who receive an explicit teaching strategy intervention and those who do not.

### 1.4. Objective of the Study

The objective of this study is to examine the effect of an explicit teaching intervention on early basic arithmetic skills of grade two students with mathematics learning difficulties.

### 1.5. Significance of the Study

Early intervention is a powerful strategy for improving children's learning outcomes and strengthening education systems. This study provides policy makers, educators, and other stakeholders with evidence-based insights into the effects of early intervention on learning outcomes for children with learning disabilities in general, and specifically on early basic arithmetic skills of students with mathematics

learning difficulties (MLDs). The findings may support efforts to enhance proficiency in addition and subtraction for struggling learners, facilitate early identification and targeted support for students with MLD, and equip trainee teachers with the skills to address learning difficulties effectively. Moreover, the results can inform curriculum design and policy decisions by highlighting the importance of early recognition and intervention for MLD, while offering guidance to government agencies, non-governmental organizations, and other institutions involved in inclusive education to better support students with mathematics learning difficulties.

### **1.6.Delimitation of the Study**

Mathematics learning difficulties affect individuals across different age groups; however, this study focuses on learners aged 8 to 9 years, as previous research indicates that interventions at this stage in primary school are most effective (Fuchs et al., 2019; Nelson et al., 2022). The study examines the effects of explicit teaching interventions on basic arithmetic skills, considering pre- and post-test and gender as independent variables. The study is delimited to four government primary schools in Dukem Municipality, Oromia, Ethiopia, with the sample comprising all grade two students identified with mathematics learning difficulties. While MLDs are not exclusive to primary school students, this research is specifically confined to lower primary grades, where early identification and intervention are most likely to produce optimal learning outcomes.

## **2. Review of Related Literature**

### **2.1.Mathematics Learning Difficulties (MLD)**

Mathematics Learning Difficulties (MLD) refers to significant and persistent challenges that students experience in learning mathematics. These difficulties often manifest in various ways, particularly in learning and recalling arithmetic facts, including basic addition and subtraction. Students with MLD frequently struggle to perform calculations accurately, which can impede their overall understanding of mathematical concepts and adversely affect their academic performance in mathematics (Muzamil, 2018).

Mathematics learning difficulties (MLD) refer to individuals who demonstrate underachievement in mathematics despite various factors that might otherwise explain performance differences (Grigorenko et al., 2020). This comprehensive definition encompasses multiple influences on mathematical performance. For the purposes of this study, the researcher adopts the term “MLD” as it aligns with the primary selection criteria: low mathematics achievement. This umbrella term captures the broad range of challenges faced by these learners, making more specific labels less appropriate. The approach allows

for a more nuanced understanding of the diverse needs of students struggling with mathematics and informs strategies aimed at improving their learning outcomes.

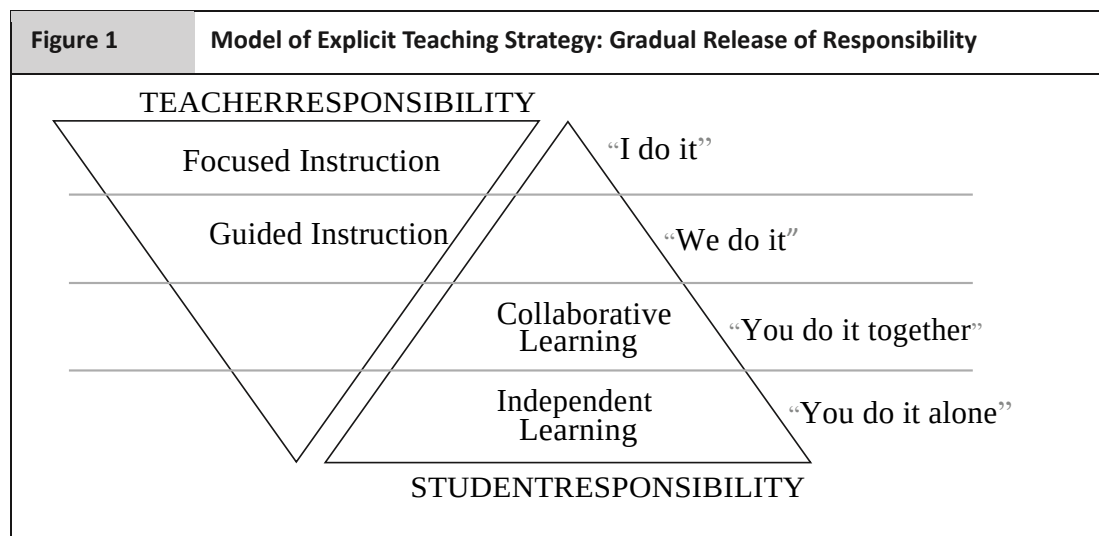
In summary, these definitions are practical and applicable to the Ethiopian context, as they align with local educational realities and assessment practices. The emphasis on specific performance indicators makes them particularly relevant. For instance, Bezuidenhout (2022) defines students with MLD as those “performing in the low average range (e.g., at or below the 35th percentile) as well as those performing well below average” (p. 294), highlighting measurable criteria that can guide identification and intervention.

## **2.2.Explicit Teaching Strategy**

The instructional problem under investigation focused on deficits in foundational arithmetic skills, particularly in addition and subtraction. Within contemporary mathematics education, explicit teaching strategies have emerged as a critical and effective pedagogical approach, especially for students experiencing learning difficulties. These strategies are characterized by a highly structured and systematic mode of instruction, with clearly defined objectives and explicit performance expectations (Seage & Türegün, 2020). Grounded in direct instructional principles, explicit teaching strategies emphasize clarity, step-by-step guidance, and the provision of immediate feedback, thereby reducing cognitive load and minimizing misconceptions. Recent research highlights their effectiveness in improving basic addition and subtraction skills among struggling learners, as they make abstract concepts more accessible and support the development of both conceptual understanding and procedural fluency. As a result, explicit teaching strategies not only address immediate learning gaps but also establish a strong foundation for continued academic success in mathematics (Rolleston et al., 2021).

Explicit teaching strategies begin with clearly defined objectives and proceed through a structured sequence of modeling, guided practice, independent practice, and lesson closure. This systematic progression supports the development of foundational understanding while gradually increasing cognitive demand as learners gain confidence in more complex content (Fife-Schaw, 2020). Throughout all stages, ongoing teacher–student interaction is essential, as it allows for the immediate correction of errors and clarification of misconceptions. Such timely feedback enhances both conceptual understanding and retention in mathematics, contributing to the development of durable arithmetic skills (Fuchs & Fuchs, 2020).

Figure1: Model of Explicit Teaching Strategy: Gradual Release of Responsibility



Adapted from Fisher, D. & Frey, N. Model of Explicit Teaching Strategy: Gradual Release of Responsibility (2023).

Explicit mathematics teaching is recognized as a multifaceted approach that enhances both students' conceptual understanding and their active engagement in the learning process. According to Ten Braak et al. (2022), the effectiveness of explicit teaching strategies depends on the integration of clear modeling, active student engagement, purposeful questioning, and continuous feedback. This comprehensive approach extends beyond the transmission of content, underscoring the central role of interactive learning processes in promoting deeper understanding and meaningful participation.

### 3. Research Design and Methodology

#### 3.1. Research Design

This study employed a quasi-experimental design incorporating pre-tests, intervention, posttests, and naturalistic observation. Such an approach is particularly appropriate in educational research contexts where random assignment to control and treatment groups is often impractical due to ethical and logistical constraints (Muzamil, 2018). The study aimed to investigate the effect of explicit teaching strategies on the basic arithmetic skills (addition & subtraction) of grade two students with mathematics learning difficulties. By utilizing this design, efforts were made to minimize the influence of extraneous variables, thereby enhancing the internal validity of the findings and providing meaningful insights into the practical implications of the intervention in educational settings (Siribie et al., 2021).

The dependent variables in this study were the performance levels of students with mathematics learning difficulties in basic arithmetic skills (addition and subtraction), while the independent variables included students' gender and the implementation of explicit teaching strategies. Measurement of these variables

was based on the percentage mean scores obtained from the pretest and posttest assessments, allowing for a comparative analysis of students' performance before and after the intervention.

The use of a non-randomized design incorporating both a control group and pre-test measures contributed to minimizing threats to internal validity (Seitz et al., 2022). In this study, an explicit teaching intervention protocol for students with mathematics learning difficulties was compared across intervention conditions and against a no-intervention control group. The inclusion of two intervention conditions ensured that instructional time remained constant when evaluating the relative effectiveness of each protocol. Additionally, the pretest and control group design helped to account for potential threats such as mortality and maturation. Given the 20-week duration of the study, participants were likely to undergo developmental changes in physical, social, emotional, and linguistic domains; however, these effects were mitigated through the inclusion of a control group that did not receive the intervention, thereby allowing for more accurate attribution of observed outcomes to the instructional strategies.

### **3.2. Population, Sample, and Sampling Techniques**

The target population of this study comprised grade two students with mathematics learning difficulties enrolled in government primary schools within Dukem city, Oromia, Ethiopia. The research was conducted across four selected government primary schools. A non-probability judgmental sampling technique was employed to select these schools, primarily due to the limited population of students with mathematics learning difficulties, which made random sampling impractical. Accordingly, schools were reselected purposively based on specific criteria, including their capacity to accommodate a relatively large student population and the availability of support programs for learners with disabilities.

Participants were selected purposively during the identification and group intervention stages using non-random criteria. Grade two students were targeted because research indicates that those who struggle with basic mathematics at the end of kindergarten or grade one are likely to continue understanding in later grades (Aunio et al., 2021; Seage et al., 2021). Additionally, early grade one and two students typically begin using procedural strategies, such as counting, to solve simple problems, making this period ideal for intervention (Aunio et al., 2021; Charitaki et al., 2021). Finally, selecting this cohort allowed access to detailed records of their prior mathematics performance, particularly in grade one, supporting a clearer understanding of their learning trajectory and difficulties.

The screening process was conducted in multiple stages. It began with school-level screening, applying criteria such as the capacity to accommodate a large student population and the provision of support programs for students with learning disabilities. Participant selection was carried out systematically,

following specific criteria during both the identification and group intervention phases. In the identification phase, a targeted cohort of 619 grade two students was selected from the designated schools. Establishing a sufficiently large initial pool was essential, given that the prevalence of students with mathematics learning difficulties (MLD) typically ranges from 5% to 40% of the student population.

The identified students underwent a second screening using a modified version of BANUCA (Tesfaye & Ludago, 2016). Following this assessment, participants were selected according to specific inclusion criteria, detailed in Table 1, to determine eligibility for study participation.

Table 1: Population, Sample and Sampling Techniques

| Population    | Sample                                                             | sampling techniques                                                                                                                                                                                                        |
|---------------|--------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| School-1=165  | 24                                                                 | <ul style="list-style-type: none"> <li>- 5% to 40% of the population</li> <li>- MLD (score 30<sup>th</sup> percentiles and below in BANUCA).</li> <li>- Being enrolled in grade two</li> <li>- Speak Afan Oromo</li> </ul> |
| School-2 =137 | 20                                                                 |                                                                                                                                                                                                                            |
| School-3=145  | 21                                                                 |                                                                                                                                                                                                                            |
| School-4=172  | 25                                                                 |                                                                                                                                                                                                                            |
| Total = 619   | 90 students (46 students in experimental and 44 in control groups) |                                                                                                                                                                                                                            |

### 3.3.Data Collection Instruments

Two types of data collection instruments were employed in this study. The Basic Numerical and Calculation Abilities (BANUCA) test battery was used to screen for students with mathematics learning difficulties, while the Early Grade Mathematics Assessment tool measured the mathematics achievement of these students, with particular emphasis on basic addition and subtraction. Both instruments are standardized in terms of procedural and instructional protocols; however, the assessment content was adapted to align with the local curriculum and context. Consequently, the measures were structured around the relevant sub-constructs and grade two mathematics textbook contents.

### 3.4.Data Analysis

The study utilized a quasi-experimental design incorporating pretests, interventions, posttests, and naturalistic observations to evaluate the effectiveness of the intervention. A nonequivalent groups design was employed, enabling comparisons between groups that were not randomly assigned. This design is particularly suited to educational and behavioral research contexts, where randomization may be impractical or ethically constrained (Fife-Schaw, 2020). The study aimed to assess the treatment effect by examining differences in pretest and posttest scores between the treatment and control groups.

The study's results were analyzed using both descriptive and inferential statistics. Descriptive measures included central tendency (mean) and dispersion (variance and standard deviation), while inferential analysis employed independent t-tests. These statistics provided insight into the distribution of scores within each group before and after the intervention, allowing the researcher to evaluate not only group means but also the variability of performance (Lein et al., 2020). In addition to highlighting overall performance trends, the analysis revealed the consistency of performance within each group.

To support the validity of the findings, recent studies in related fields were referenced, demonstrating the appropriateness and relevance of the analytical methods employed. For instance, prior research has shown that quasi-experimental designs are effective in contexts where random assignments are not feasible (Em, 2024). Additionally, contemporary studies underscore the importance of applying rigorous statistical techniques, such as independent samples t-tests, to ensure reliable and valid conclusions, particularly in the evaluation of educational interventions (Fife-Schaw, 2020).

Naturalistic observations were also conducted to complement the quantitative analysis, providing contextual insights that enriched the interpretation of pre-test and post-test data. This qualitative dimension allowed for an exploration of factors influencing student performance, offering a deeper understanding of the learning process. By integrating quantitative results with observational findings, the study produced a more nuanced evaluation of the intervention's effectiveness. Such triangulation enhanced the overall validity and credibility of the findings (Leavy, 2022).

### **3.5.Ethical Considerations**

All ethical considerations were fully addressed in this study. Approval was obtained in writing from the Educational Review Board of Ambo University College, and the research commenced only after clearance from the university's Institutional Review Board (IRB). Informed consent was secured from all participants through parental consent prior to their involvement, ensuring that both students and parents clearly understood the study's purpose and the participants' roles. Additionally, strict procedures were followed to maintain the confidentiality of participants' responses throughout the research process.

## 4. Results and Discussion

### 4.1.Addition and Subtraction Performance

Table 2: Independent Samples t-Test Results for Addition and Subtraction Tasks

| Task                           | Group        | Mean Difference | t      | df    | p (2-tailed) |
|--------------------------------|--------------|-----------------|--------|-------|--------------|
| Addition without carrying over | Control      | -9.35           | -19.81 | 70.95 | < .001       |
|                                | Experimental |                 |        |       |              |
| Addition with carrying over    | Control      | -1.86           | -12.61 | 72.89 | < .001       |
|                                | Experimental |                 |        |       |              |
| Substruction without borrowing | Control      | -8.67           | -17.07 | 88    | < .001       |
|                                | Experimental |                 |        |       |              |
| Substruction with borrowing    | Control      | -2.43           | -18.45 | 88    | < .001       |
|                                | Experimental |                 |        |       |              |
| Combined Addition              |              | -5.61           |        |       | < .001       |
| Combined Substruction          |              | -5.55           |        |       | < .001       |

The intervention led to significant improvements in basic arithmetic skills-specifically addition and subtraction among students with mathematics learning difficulties ( $p < .001$ ). Mean differences were  $-9.35$  for addition without carrying,  $-1.86$  for addition with carrying,  $-8.67$  for subtraction without borrowing, and  $-2.43$  for subtraction with borrowing, demonstrating substantial gains in both simple and more complex operation. Overall, combined scores increased by approximately 5.6 points for addition and 5.5 points for subtraction ( $SD \approx 2$ ), reflecting consistent and meaningful improvements across participants.

The observed improvements in basic addition and subtraction align closely with the findings of Fuchs et al. (2022), who reported that clear and explicit teaching methods can reduce achievement gaps among students struggling with foundational arithmetic while simultaneously enhancing engagement and motivation. Similarly, Hudson et al. (2021) highlighted the effectiveness of explicit teaching in basic arithmetic skills through meta-analytic study, demonstrating that such strategies consistently produce better outcomes for both general and struggling learners.

Observational data indicated that students with mathematics learning difficulties in the experimental group demonstrated substantial post-test gains compared to the control group. The teachers' use of the "I do, We do, You do" instructional frame work enabled students to perform more effectively on addition tasks involving two single-digit numbers with sums less than 20. This gradual release of responsibility model allowed students to internalize mathematical skills, significantly enhancing both their confidence and overall competence in mathematics (Fritz et al., 2019).

## 5. Conclusions and Recommendations

### 5.1.Implications for Future Practice

This study demonstrates that explicit teaching interventions in basic arithmetic skills (addition and subtraction) significantly enhance academic performance, highlighting the need for teachers to implement systematic strategies tailored to the specific needs of students with mathematics learning difficulties. The combination of robust statistical results, notable effect sizes, and supportive qualitative observations underscores the value of integrating explicit teaching into early-grade mathematics curricula. Schools are encouraged to adopt evidence-based practices and provide ongoing professional development to equip teachers with effective methods for supporting all learners, particularly those at risk of academic difficulties in mathematics (Gurganus, 2021). Future research should examine the long-term effects of such interventions to determine their role in establishing a durable mathematical foundation for students with learning difficulties.

### 5.2.Recommendations for Teachers

1. **Implementation of Explicit Teaching Interventions:** The marked gains in basic arithmetic skills (addition and subtraction) observed in the experimental group suggest that teachers should integrate explicit teaching strategies into their lesson plans. Approaches such as the “I do, We do, You do” method not only enhance mathematical competency but also foster students’ confidence and independence in problem-solving. The effectiveness of this approach is further supported by Fuchs et al. (2020), who emphasize the critical role of explicit teaching strategies for students with mathematics learning difficulties.
2. **Personalized Explicit Instruction and Scaffolding:** Explicit teaching techniques should be adapted to meet the individual needs of students with mathematics learning difficulties, providing targeted support and scaffolding so that each learner can engage with numeracy concepts at an appropriate level. Evidence shows that combining constructive feedback with a structured, systematic approach to instructional leads to substantial improvements in student performance (Sundho et al., 2023). Therefore, teachers should continuously monitor student progress and refine their instructional methods to promote more effective learning outcomes.
3. **Integration of Manipulatives and Visual Aids:** Research indicates that the use of manipulatives significantly enhances students’ understanding of abstract numerical concepts. This study demonstrated that students made notable gains when engaging with concrete objects during mathematics lessons. Teachers are encouraged to incorporate manipulatives and visual aids into instruction, as these tools help students form connections, improve retention, and clarify mathematical content benefits that are especially important for learners with mathematics learning difficulties (Wiberg, 2019).

4. **Fostering a Positive Learning Environment:** Establishing a safe and supportive classroom culture is crucial for encouraging students to take risks in their learning. When teachers promote inquiry, collaboration, and constructive feedback, they can significantly enhance students' self-efficacy in mathematics. A positive learning environment fosters engagement and motivation, which in turn supports academic success (Ginsburg & Eder, 2023). This is particularly important for students with mathematics learning difficulties, for whom developing a confident and positive attitude toward mathematics is essential.

### 5.3.Conclusion

In conclusion, the findings of this study highlight the critical role of explicit teaching interventions in improving basic arithmetic skills (addition and subtraction) among grade two students with mathematics learning difficulties. By applying the practical recommendations and future research directions outlined in this paper, educators and researchers can develop mathematics instruction tailored to the diverse needs of these students. Emphasizing evidence-based strategies, supportive learning environments, and ongoing professional development can further enhance the educational outcomes of students struggling with basic arithmetic skills.

## REFERENCES

1. Asfaw, A. (2023). Refugees and Learning: A Study of Early Grade Mathematics Competency in Kebribeyah and Awbarre Refugee Schools, Ethiopia. *The Ethiopian Journal Of Behavioural Studies*, 6(2), 1-29.
2. Aunio, P., Korhonen, J., Ragpot, L., Törmänen, M., & Henning, E. (2021). An early numeracy intervention for first-graders at risk for mathematical learning difficulties. *Early Childhood Research Quarterly*, 55, 252-262.
3. Awgichew, S. (2022). Functionality of literacy and numeracy in first cycle primary school: A look in to the curriculum and instructional process. *International Journal of Education and Literacy Studies*, 10(3), 101-112.
4. Ayalew, Y. (2019). Mathematics Education in Ethiopia: A Systematic Review of Twenty Years of Discourses on the Discipline. *International Conference on Science and Mathematics Education* 23rd-25th October,
5. Bezuidenhout, H. S. (2022). Associations between early numeracy and mathematics-specific vocabulary. *South African Journal of Childhood Education*, 12(1), 1191.
6. Charitaki, G., Tzivinikou, S., Stefanou, G., & Soulis, S.-G. (2021). A meta-analytic synthesis of early numeracy interventions for low-performing young children. *SN Social Sciences*, 1(5), 105.
7. Em, S. (2024). Exploring experimental research: Methodologies, designs, and applications across disciplines. *Designs, and Applications Across Disciplines*.

8. Fife-Schaw, C. (2020). Quasi-experimental designs (including observational methods). *Research Methods in Psychology*, 161-180.
9. Fritz, A., Haase, V. G., & Rasanen, P. (2019). *International handbook of mathematical learning difficulties*. Cham, Switzerland: Springer.
10. Fuchs, L., Fuchs, D., Seethaler, P. M., & Barnes, M. A. (2020). Addressing the role of working memory in mathematical word-problem solving when designing intervention for struggling learners. *ZDM*, 52, 87-96.
11. Gopalan, M., Rosinger, K., & Ahn, J. B. (2020). Use of quasi-experimental research designs in education research: Growth, promise, and challenges. *Review of Research in Education*, 44(1), 218-243.
12. Grigorenko, E. L., Compton, D. L., Fuchs, L. S., Wagner, R. K., Willcutt, E. G., & Fletcher, J. M. (2020). Understanding, educating, and supporting children with specific learning disabilities: 50 years of science and practice. *American Psychologist*, 75(1), 37.
13. Gurganus, S. P. (2021). *Math instruction for students with learning difficulties*. Routledge.
14. Hattie, H. (2021). Early numeracy development: identifying and supporting children at risk for mathematical learning difficulties.
15. Holopainen, L., & Hakkarainen, A. (2019). Longitudinal effects of reading and/or mathematical difficulties: The role of special education in graduation from upper secondary education. *Journal of Learning Disabilities*, 52(6), 456-467.
16. Hudson, K. N., Ballou, H. M., & Willoughby, M. T. (2021). Improving motor competence skills in early childhood has corollary benefits for executive function and numeracy skills. *Developmental science*, 24(4), e13071.
17. Leavy, P. (2022). *Research design: Quantitative, qualitative, mixed methods, arts-based, and community-based participatory research approaches*. Guilford Publications.
18. Lein, A. E., Jitendra, A. K., & Harwell, M. R. (2020). Effectiveness of mathematical word problem solving interventions for students with learning disabilities and/or mathematics difficulties: A meta-analysis. *Journal of Educational Psychology*, 112(7), 1388.
19. Mekonnen, A. M. (2022). Specific learning disabilities in the eyes of schoolteachers in Ethiopia. *Reading & Writing Quarterly*, 1-11.
20. Mulcahy, C., Day Hess, C. A., Clements, D. H., Ernst, J. R., Pan, S. E., Mazzocco, M. M., & Sarama, J. (2021). Supporting young children's development of executive function through early mathematics. *Policy Insights from the Behavioral and Brain Sciences*, 8(2), 192-199.
21. Mutlu, Y. (2019). Math Anxiety in Students with and without Math Learning Difficulties. *International Electronic Journal of Elementary Education*, 11(5), 471-475.
22. Muzamil, A. (2018). *Educational Practices, Opportunities and Challenges of Children with Learning Disabilities*.

23. Outhwaite, L. A., Faulder, M., Gulliford, A., & Pitchford, N. J. (2019). Raising early achievement in math with interactive apps: A randomized control trial. *Journal of Educational Psychology*, 111(2), 284.
24. Rolleston, C., Hoddinott, J., Dawit, T., Sabates, R., & Woldehanna, T. (2021). Understanding Achievement in Numeracy Among Primary School Children in Ethiopia: Evidence from RISE Ethiopia Study.
25. Seage, S. J., & Türegün, M. (2020). The Effects of Blended Learning on STEM Achievement of Elementary School Students. *International Journal of Research in Education and Science*, 6(1), 133-140.
26. Seitz, M., & Weinert, S. (2022). Numeracy skills in young children as predictors of mathematical competence. *British Journal of Developmental Psychology*, 40(2), 224-241.
27. Sundho, A. N., & Ali, M. A. (2023). Effect of Explicit Teaching Modeling on Academic Achievement of Primary Level Students in Mathematics: An Experimental Study. *Annals of Human and Social Sciences*, 4(2), 25-35.
28. Siribie, M., Tchouatieu, A.-M., Soulama, I., Kaboré, J. M. T., Nombéré, Y., Hien, D., Koumaré, A. K., Barry, N., Baguiya, A., & Héma, A. (2021). Protocol for a quasi-experimental study to assess the feasibility, acceptability and costs of multiple first-lines artemisinin-based combination therapies for uncomplicated malaria in the Kaya health district, Burkina Faso. *BMJ open*, 11(2), e040220.
29. Tefera, A., Atnafu, M., & Michael, K. (2021). The Relevance of Current Ethiopian Primary School Teacher Education Program for Pre-Service Mathematics Teacher's Knowledge and Teacher Educator's Awareness about Mathematics Knowledge for Teaching. *EURASIA Journal of Mathematics, Science and Technology Education*, 17(5).
30. Ten Braak, D., Lenes, R., Purpura, D. J., Schmitt, S. A., & Størksen, I. (2022). Why do early mathematics skills predict later mathematics and reading achievement? The role of executive function. *Journal of Experimental Child Psychology*, 214, 105306.
31. Tesfaye, M., & Ludago, T. B. (2016). Academic Achievement of Students with Math learning Difficulties in Dilla Primary School, Gedeo Zone. *Turkish International Journal of Special Education and Guidance & Counselling* ISSN: 1300-7432, 5(2), 23-42.
32. Tiruneh, D., Hoddinott, J., Rolleston, C., Sabates, R., & Woldehanna, T. (2021). Understanding achievement in numeracy among primary school children in ethiopia: evidence from rise ethiopia study.
33. Tout, D. (2020a). Critical connections between numeracy and mathematics.
34. Tout, D. (2020b). Evolution of adult numeracy from quantitative literacy to numeracy: Lessons learned from international assessments. *International Review of Education*, 66, 183-209.

35. Wiberg, M. (2019). The relationship between TIMSS mathematics achievements, grades, and national test scores. *Education Inquiry*, 10(4), 328-343.
36. Zakariya, Y. F. (2021). Undergraduate students' performance in mathematics: Individual and combined effects of approaches to learning, self-efficacy, and prior mathematics knowledge.

