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ORIGINAL RESEARCH PAPER

SELF-REGULATED LEARNING AND WRITING SKILL DEVELOPMENT IN CHILDREN WITH INTELLECTUAL DISABILITY

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ABSTRACT

Background: Writing is a complex skill that requires not only linguistic competence but also metacognitive regulation. Self-regulated learning (SRL) strategies, which emphasize setting goals, self-monitoring, and self-evaluation, have been shown to enhance academic performance across disciplines. However, limited studies have examined their direct impact on writing skill development in higher education contexts. Hence, the present study aimed to explore the effect of self-regulated strategies on improving the writing skills of children with intellectual disabilities.

Methods: A single-group pre-test/post-test design was employed with a sample of 10 participants with mild to moderate intellectual disabilities, aged 11-14 years. Students were introduced to SRL strategies through flash cards and worksheets integrated into writing instruction, focusing on planning, monitoring progress, and reflecting on outcomes. Data were collected using standardized writing assessments, and statistical analysis was conducted through the Wilcoxon signed-rank test to compare pre-test and post-test scores.

Results: The median pre-test score ($Mdn = 4.00$) increased to 7.00 in the post-test, which reflects a substantial performance improvement among the participants. Statistical analysis yielded a Z value of 2.99, $p = 0.003$, confirming significance at the 0.05 level. The effect size ($r = 0.95$) was exceptionally high, indicating that the intervention produced a robust and meaningful impact on participants' scores.

Outcome: The findings demonstrate that SRL strategies can significantly improve writing skills, fostering autonomy and reflective practice among learners. Embedding SRL frameworks into writing instruction can help students develop metacognitive awareness and lifelong writing competencies. Future research should explore the long-term effects of SRL interventions and examine their applicability across diverse learner populations and digital learning environments.

KEYWORDS: Self-regulated learning, Writing skills, Academic performance, Learner autonomy, Intellectual Disability

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1. INTRODUCTION

Writing is an essential academic skill that requires not only linguistic ability but also metacognitive skills. For children with intellectual disability, writing often presents substantial limitations due to difficulties in planning, organizing, and monitoring their work. Self-regulated learning (SRL) proposes an organized outline that enables learners to set goals, monitor progress, and evaluate outcomes, thereby promoting autonomy and persistence in learning tasks. SRL has been generally documented as an influential method in improving academic performance by integrating cognitive, behavioural, and emotional strategies [1]. However, while SRL has been widely studied among typically developing students, its application to children with intellectual disability remains underexplored, making this study both timely and necessary.

In general, several studies have emphasized the efficacy of SRL-based interventions in teaching writing skills. The self-regulated strategy development (SRSD) model documented significant gains in the quality of writing, organization of letters, and self-monitoring of children with learning disabilities [2]. Teaching self-regulation skills to students with disabilities expands their ability to plan and revise written work, leading to measurable improvements in literacy outcomes [3]. Similarly, SRL-based instruction improved academic writing among EFL learners, underscoring the role of metacognitive awareness in producing coherent texts [4]. These findings suggest that SRL strategies can be adapted to diverse populations, including children with intellectual disability, to strengthen writing performance.

Self-Regulated Learning provides a structured pathway for fostering writing skills in children with intellectual disabilities by integrating cognitive, motivational, and behavioural processes. Zimmerman's cyclical model [5], comprising forethought, performance, and self-reflection, offers a clear scaffold for designing interventions that align with inclusive pedagogy. Supplemented by Bandura's Social Cognitive Theory [6] and Vygotsky's Sociocultural Theory [7], SRL emphasizes self-efficacy, observational learning, scaffolding, and co-regulation, ensuring that learners gradually assume responsibility for their writing tasks. By embedding SRL phases into writing interventions, educators can promote autonomy and persistence in children with intellectual disabilities, aligning instructional strategies with inclusive education, and enhancing academic outcomes by combining metacognitive awareness with practical skill-building. Figure 1 illustrates Zimmerman's SRL Cyclical model:

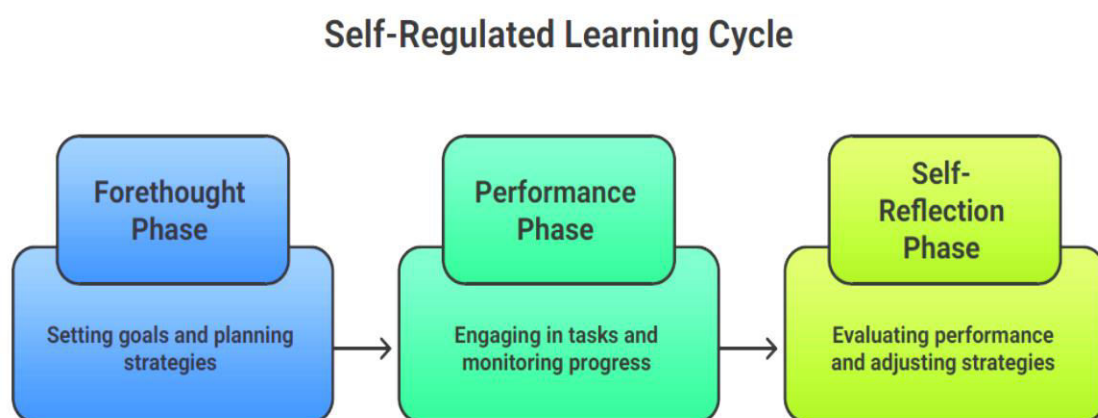


Figure1: Zimmerman's SRL Cyclical Model

Children with intellectual disabilities often face dual challenges: the limitations imposed by their condition and the barriers to independent living in academic and community contexts. Writing, in particular, poses significant difficulties, as many children struggle with both the physical act of writing and the logical sequencing of ideas into coherent, well-structured text [8]. Self-regulation provides a

pathway to address these challenges, as it enables learners to take charge of their own learning by setting goals, monitoring progress, and making adjustments to achieve desired outcomes [5].

The Self-Regulated Strategy Development (SRSD) model is a systematic and structured instructional approach to writing that equips learners with essential skills of goal setting, planning, self-motivation, attention control, flexible use of learning strategies, self-monitoring, appropriate help-seeking, and self-evaluation [9]. Research has shown that SRSD improves writing quality, motivation, and self-efficacy among students with learning difficulties, making it particularly relevant for children with intellectual disabilities [10,11]. The ultimate purpose of training persons with intellectual disabilities is to foster independence across all areas of life. Despite these promising results, there is limited empirical evidence on the impact of SRL interventions specifically for children with intellectual disability. Most existing studies focus on students with learning disabilities or at-risk populations, leaving a gap in understanding how SRL can be tailored to meet the unique needs of children with intellectual disability. Addressing this gap, the present study investigates the effectiveness of SRL strategies in improving writing skills among children aged 11–14 years enrolled in a special school setting. By employing a pre-test/post-test design with a researcher-developed achievement test, this study aims to provide evidence of the practical and educational significance of SRL in fostering writing development for learners with intellectual disability, thereby contributing to both their academic progress and broader personal empowerment.

1.1 Objective of the Study

The objective of this study is to examine the effectiveness of a Self-Regulated Learning based intervention in enhancing writing skills among children with intellectual disabilities.

Specifically, the study aims to map the cyclical phases of SRL, namely, forethought, performance, and self-reflection, to structured writing activities such as tracing, dot-joining, and sentence construction, and to evaluate the impact of these strategies on learners' writing fluency, accuracy, and self-efficacy. By integrating SRL theory with pedagogical practices, the study aims to provide evidence-based insights into how metacognitive and motivational supports foster autonomy and academic progress in special education contexts.

2. MATERIALS AND METHODS

The present study employed a single-group pretest-post-test research design. A systematic procedure was implemented to conduct the present study, ensuring that the objectives were achieved in a meaningful manner. Based on these objectives, suitable participants were identified through purposive sampling. A set of ten words was selected from the baseline data of the chosen sample. The intervention, grounded in self-regulated learning (SRL) strategies, was systematically implemented by the researcher to teach writing skills. An achievement test, developed using the selected ten words, was administered both before and after the intervention to measure performance. Proper approval was obtained from the school authorities, and informed consent was secured from the parents. The study subsequently collected and analysed primary data.

2.1 Study participants

Ten Children with intellectual disability, aged 11-14 years, enrolled in a special school, were selected as participants for the study. The selection process followed specific inclusion and exclusion criteria to ensure the appropriateness of the participants.

Inclusion Criteria

- Both boy and girl children were eligible.
- Age range between 11 and 14 years.
- Children diagnosed and certified with mild and moderate intellectual disability who demonstrated the ability to write and follow instructions.
- Enrollment in the identified special school at the time of the study (February 2025).

Exclusion Criteria

- Children with additional disabilities such as visual, auditory, or other co-occurring conditions.
- Children studying in inclusive school settings or receiving home-based instruction

Table 1: Profile of Study Participants

Sl.No	Name	Age	Gender	Level of Disability
1	K. R	14	Boy	Moderate
2	B. S	12	Girl	Mild
3	S. S	13	Girl	Moderate
4	D.J	12	Girl	Mild
5	P. S	14	Boy	Moderate
6	S. A	14	Boy	Moderate
7	S. K	11	Boy	Mild
8	M.A	13	Boy	Moderate
9	S. Y	14	Boy	Moderate
10	D. P	11	Girl	Mild

2.2 Materials

The following materials were employed to implement the intervention and measure outcomes:

- **Achievement Test:** A researcher-developed test based on the ten selected words was designed to assess writing performance. The test was administered both before and after the intervention to measure improvement. It included tasks such as recognition, tracing, dot joining, and independent writing of the selected words, thereby providing a reliable measure of progress in writing skills.
- **Flash Cards:** Visual flash cards were developed for each of the selected ten words. These were used to introduce the words, reinforce recognition, and provide repeated exposure during instructional sessions.
- **Worksheets for Writing Practice:** Structured worksheets were developed to scaffold writing skill acquisition. They included three progressive formats:
 1. Tracing – learners traced over printed words to develop motor coordination and familiarity with letter forms.
 2. Dot Joining – learners connected dotted outlines of words to strengthen fine motor skills and accuracy.
 3. Copying – learners copied words independently to consolidate writing fluency and reinforce self-monitoring.

Flash cards



Worksheets

**Figure 2: Pictorial Representation of Materials for a single word**

Together, these materials were systematically integrated into the self-regulated learning framework, enabling participants to plan, monitor, and evaluate their writing progress across the 20 instructional sessions. Table 1 describes the purpose of instructional materials and SRL strategies for developing the writing skills of the study participants.

Table 2: Instructional Materials, Purpose, and SRL Strategies

	Purpose	Self-Regulated Learning	
		Phase	Strategy
Achievement Test	To measure baseline and post-intervention writing performance using the selected 10 words	Self-Reflection	Self-evaluation - assessing progress and outcomes
Flash Cards	To introduce and reinforce recognition of the selected words through repeated exposure	Forethought	Setting of Goals & tracking - identifying selected words and analysing their developmental outcomes
Worksheets – Tracing words	To enhance motor skill coordination and develop familiarity with letter shapes through word-tracing activities	Performance and Self-regulation	Practice - structured rehearsal of writing tasks
Worksheets - Dot Joining	To strengthen fine motor skills and accuracy by connecting the dotted outlines of words	Performance and self-monitoring	Monitoring - checking progress against guided patterns
Worksheets – Copying words	To consolidate writing fluency and encourage independent word production	Self-Reflection	Autonomy - practicing independent writing and evaluating output

2.3 Intervention

The intervention was designed around SRL principles, emphasizing planning, monitoring, and self-evaluation during writing tasks. The selected words were taught to the participants across 20 sessions, each lasting one hour per day, five days a week, over a period of four weeks (20 days in total) during February 2025. The achievement test was administered before the intervention (pre-test) and repeated after the intervention (post-test) to assess improvement in writing skills. Figure 3 presents the intervention schedule for four weeks with 20 sessions.

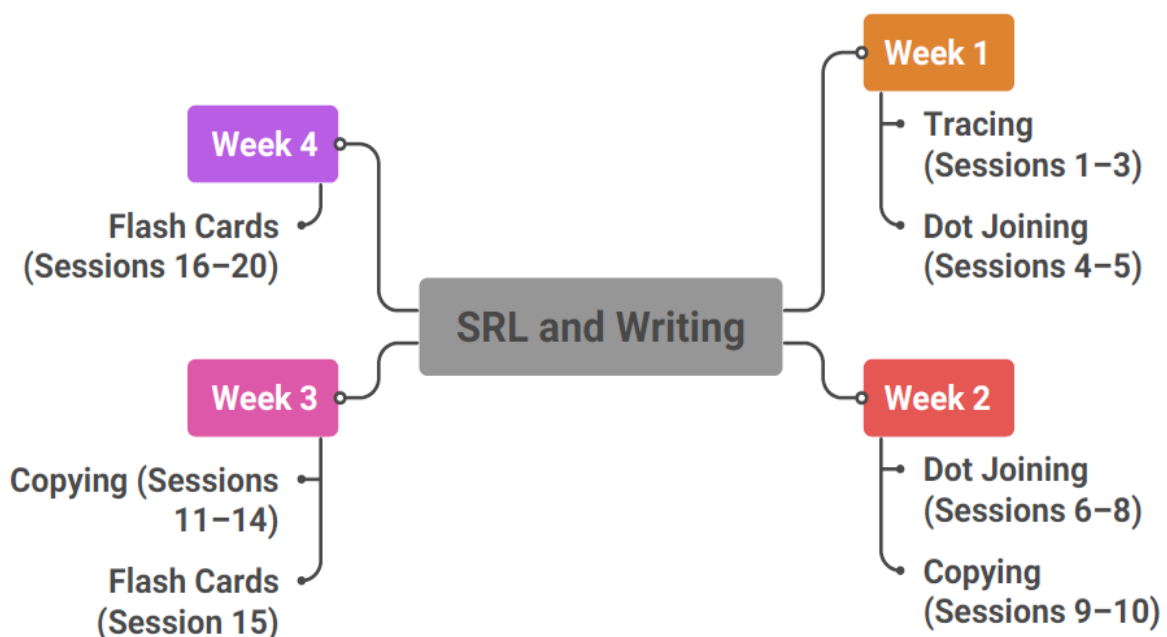


Figure 3: Intervention Schedule across Four Weeks

3. RESULTS

The analysis of the intervention data collected directly from the participants highlights the influence of Self-Regulated Learning (SRL) strategies when integrated into structured writing activities for children with intellectual disabilities.

Research Question 1: How does Self-Regulated Learning influence the writing skills of children with intellectual disabilities?

To address this research question, the writing performance of children with intellectual disabilities was assessed before and after the intervention using Self-Regulated Learning (SRL) strategies. Table 2 presents the comparison of pre-test and post-test scores across the targeted dimensions of writing.

Table 3: Comparison of Pre-test and Post-test Scores in writing through SRL (N = 10)

SRL & Writing	N	Mean	Median	Z value	p-value	Effect Size (r)
Pre-test	10	4.30	4	2.99	0.003	0.95
Post-test	10	6.80	7			

The Wilcoxon Signed-Rank Test compared the pre-test and post-test scores of the same participants to determine whether there was a statistically significant improvement after the intervention. The results show that the median pre-test score was 4.00, while the median post-test score increased to 7.00, indicating a substantial rise in performance.

The analysis produced a Z value of 2.99 with a p-value of 0.003, which is below the standard significance level of 0.05. This means that the improvement from pre-test to post-test is statistically significant. The effect size ($r = 0.95$) is exceptionally high and substantial, demonstrating that the intervention had a strong and meaningful impact on participants' scores.

4. DISCUSSION

The present study revealed that self-regulated learning strategies significantly improved the writing performance of study participants, with post-test scores showing a marked increase compared to pre-test scores. The findings from the Wilcoxon Signed-Rank Test provide strong evidence that the intervention produced a meaningful improvement in participants' outcomes. The post-test median score (7.00) was notably higher than the pre-test median (4.00), reflecting considerable growth in performance levels. The statistically significant Z value (2.99, $p = 0.003$) confirms that this improvement was unlikely to have occurred by chance. The effect size was extremely high ($r = 0.95$), which indicates that the magnitude of the change was not only statistically significant but also practically significant in real-world terms. These results suggest that the intervention successfully enhanced participants' abilities, supporting the effectiveness of the instructional or training strategy used in the study. The substantial increase observed aligns with prior evidence that structured and targeted interventions can lead to measurable learning gains. Overall, the table clearly demonstrates that the intervention had a strong positive influence on participant performance.

SRL-based instruction significantly improved EFL students' academic writing skills, highlighting the importance of metacognitive regulation and self-monitoring in producing coherent texts [4]. Similarly, SRL strategies predicted writing performance among English majors, suggesting that learners who actively plan, monitor, and evaluate their writing processes achieve higher levels of proficiency [8]. Furthermore, it is confirmed that self-directed learning, closely related to SRL, positively impacts academic writing, particularly when combined with critical thinking ability [12].

The exceptionally high effect size between pre-test and post-test scores demonstrates the strong overall impact of SRL strategies. SRL interventions foster improvement even among students with weaker baseline writing skills. Collectively, these studies support the conclusion that SRL empowers learners to take ownership of their writing development, leading to sustained improvements in both performance and confidence [12]. In practical terms, embedding SRL frameworks into writing

instruction can cultivate autonomy, persistence, and reflective practice. By teaching students to set goals, monitor progress, and evaluate outcomes, educators can foster lifelong writing skills that extend beyond academic contexts. The integration of SRL into curriculum design is therefore essential for promoting inclusive and effective writing pedagogy.

5. IMPLICATIONS OF THE STUDY

The findings of this study underscore the transformative potential of self-regulated learning (SRL) strategies in enhancing writing skill development among children with intellectual disabilities. By demonstrating that structured interventions such as goal setting, self-monitoring, and scaffolded practice through flashcards, tracing, dot joining, and copying worksheets can significantly improve writing performance, the study extends the applicability of SRL frameworks to inclusive education contexts.

From a *theoretical perspective*, the results contribute to the growing body of evidence that SRL is not limited to typically developing learners but can be adapted to meet the needs of diverse populations. This reinforces the importance of integrating cognitive and behavioural scaffolds into SRL models to support learners with intellectual disabilities.

In terms of *practice*, the present study offers clear guidance for classroom practice in special education. Teachers can embed self-regulated learning (SRL) strategies into daily instruction to foster independence and writing fluency among children with intellectual disabilities, thereby reducing reliance on rote methods and promoting active participation. Institutions can also incorporate SRL-focused training into professional development programs, ensuring that educators are equipped to apply adaptive strategies that enhance both academic performance and learner confidence.

At the *policy level*, the findings highlight the need for curriculum frameworks and teacher training programs that prioritize SRL strategies as a core component of inclusive pedagogy. Recognizing SRL as a competency within special education policy can strengthen institutional support for adaptive teaching practices.

Finally, the study opens avenues for *future research*, including longitudinal investigations into the sustained impact of SRL on academic achievement and self-efficacy, as well as comparative studies across subject domains and learner groups. Such research can refine inclusive pedagogical models and further validate SRL as a cornerstone of effective intervention.

6. CONCLUSION

This study demonstrates that integrating Self-Regulated Learning strategies into structured writing activities can significantly enhance the writing performance of children with intellectual disabilities. By mapping the cyclical phases of SRL, forethought, performance, and self-reflection to interventions such as tracing, dot-joining, and sentence construction, learners were supported in developing fluency, accuracy, and self-efficacy. The findings highlight that SRL not only fosters metacognitive awareness and motivational engagement but also promotes autonomy and resilience, even among students with weaker baseline skills. Importantly, the study underscores the value of inclusive pedagogical practices that scaffold learning while gradually transferring responsibility to the learner. These results contribute evidence-based insights into how SRL can be effectively adapted for special education contexts, offering a pathway to improved academic outcomes and greater participation in inclusive classrooms.

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