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# The Use of Meta-Cognitive Self-Assessment Strategies: An Experimental Study of Developing Writing Skills among Students of District Malakand

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## ABSTRACT

Metacognition plays a vital role in the teaching and learning process which involves reading, writing development, problem-solving, self-control, attention, communication and personality development. Knowing how to teach the procedure for awareness of learning does not ensure effective teaching, and if not, teaching to the student deteriorates to trial-and-error and dull. It was an experimental study to find the impact of metacognitive self-assessment strategies on writing skills of grade 9 and 10 girl students of government girls secondary school Dargai and Sakhakot, District Malakand, KPK, Pakistan. A quasi-experimental pretest/posttest control group design was used. Four government girls' high schools were chosen. A total of 120 students (60 experimental group and 60 control group) participated. The intervention group was given a 30-day period for the implementation of metacognitive self-assessment strategies (planning, monitoring, evaluating and reflecting using rubrics, journals and feedback) and the control group was provided with traditional lecture approaches. The data collection tools consisted of a researcher-developed Writing Skills Test (pre- and post-test) for vocabulary, grammar, punctuation, organization, and writing in an essay, as well as a teacher questionnaire that included 26 items on metacognitive approaches to developing writing. The instruments were expertly validated and pilot tested with Cronbach's Alpha of 0.89 for test and 0.87 for questionnaire. The data was analysed using SPSS 26 with descriptive statistics (mean and standard deviation) and independent samples t-tests. No significant differences between groups were revealed by the results of the pre test. A post test indicated that there was a statistically significant difference for the experimental group in all components (overall $t = -8.12$, $p < .001$). Self-assessment strategies were rated as very effective with high agreement among teachers. The study results show that metacognitive self-assessment strategies make a significant contribution to improving writing skills. Teachers are advised to incorporate these strategies within the English classroom and have training in metacognitive teaching.

**KEYWORDS**: Metacognitive Self-Assessment, Writing Skills, Experimental Study, District Malakand, Secondary Students, Pakistan, Quasi-Experimental Design

## INTRODUCTION

In a globalized world, communication has become more and more central and has become the foundation of social, academic and professional interaction. For the general public in Pakistan, English is not just a subject; it is a key to accessing the opportunity of higher education, employment, and networking with the world beyond the borders of Pakistan. The importance of English Language Proficiency in terms of reading and writing has been highlighted in various National Education Policies since 1998 to the date and subsequently (Government of Pakistan, 1998; 2009) as an important skill for students at the completion of primary and secondary

schooling. In spite of all these policy directives, empirical facts in public sector schools show that there are still some weaknesses, particularly in the area of writing.

Writing is a complex recursive thinking task that requires concurrent thinking about ideation, organization, word choice, grammatical accuracy, punctuation, coherence, and audience awareness (Graham, Harris & Mason, 2005; Baker, 2002). Writing is a permanent record and it is more metacognitive than speaking. The demands are often met with difficulty at Secondary Level (Grades 9 and 10) in rural and semi-urban districts like Malakand in KP. The problem is further compounded due to large classes (more than 50 students), very little instructional time spent on English (5-6 periods per week), predominance of traditional pedagogies with lecture and rote learning approaches and the lack of formative feedback (Dar & Khan, 2015; Farooq, Hassan & Wahid, 2012).

The context of the District Malakand (Tehsil Dargai) is a representative microcosm of these challenges. The government girls' high schools in these areas educate girls from predominantly rural backgrounds and where there is very little exposure to English outside of school. The results of the board examinations (BISE Malakand) and the anecdotal evidence of teachers clearly show that students' performance in essay writing, letter/application writing and description/narration writing is weak. Students frequently write a beautiful, well-structured, and grammatically precise essay that doesn't convey a clear or strong message. The deficiencies manifest themselves not only in marks but also in a lack of confidence, critical thinking and future job market opportunities as the ability to write in English becomes more important.

There are many recognized sources of difficult writing that relate to the thought process and the attitudes of writers. Many students are unaware of their own writing processes, meaning their own experience of planning, monitoring and evaluating their writing in a systematic way and not according to their own explicit criteria. This dearth of self-regulation is echoed in larger concerns in Pakistani education regarding the development of higher order thinking skills. To fill these gaps, the concept of metacognition: “knowledge about and control of one's own cognition” (Flavell, 1976: 232; 1979) provides a strong theoretical and pedagogical framework. Metacognitive self-assessment strategies involve the learner stepping out of the writing task to think about his/her strengths and weaknesses, to establish clear goals for improvement, to use a rubric or journal to track progress, and to make strategic changes.

The study of metacognition is becoming more popular in Pakistan, but most of the studies have been conducted on prospective teachers' academic achievement and reading comprehension and not on writing skills at secondary schools level. The studies by Ali, Batool and Rashid (2022) proved that there was a moderate significant impact of metacognitive skills on the achievement of prospective teachers statistically. A significant positive moderate correlation was found between metacognitive awareness and reading comprehension among prospective teachers by Hussain, Hashmi and Mehboob (2019) with no significant differences between gender and sector. Pervaiz, Shahzadi and Arshad (2022) have validated the Metacognitive Awareness of Reading Strategies Inventory (MARSI) in the context of Pakistan and there were high positive correlations with reading performance. Ilyas, Hussain and Naz (2025) also correlated metacognitive awareness with high learning motivation.

Yet, research on metacognition skills training in writing is still limited in secondary schools, especially government girls schools in KP. Misbah Noor, Aqsa and Rana (2024) in Punjab with Grade 7 girls were heavily influential in the quasi-experimental study which yielded significant

improvements in the vocabulary, grammar, punctuation and essay writing area with metacognitive self-assessment. They provide methodological and conceptual groundwork for this study.

Current research thus fills this gap in context and empirical evidences in a rigorous 30-day experimental research in four Government Girls High Schools of the Dargai and Sakhakot in the District Malakand of Hazara Division. It uses pretest post test, control group design, validated instrument (26 item teacher perception questionnaire) and powerful statistical analysis using SPSS. Representing the voices of teachers on feasibility and implementation, the study provides localised, actionable evidence for the effectiveness of metacognitive self-assessment in writing development in this relatively little-studied geographic context, and specifically for female secondary students. The results will be used for curriculum reform, teacher professional development and classroom practice in similar resource constrained classrooms in Pakistan.

## STATEMENT OF THE PROBLEM

The students of Government Girls Schools, Dargai and Sakhakot, District Malakand, have low standards of writing skills in terms of vocabulary, grammar, punctuation, organization and essay writing though English is compulsory. The traditional approach of teaching writing does not foster self-awareness, reflection and strategic regulation of the writing process. It is an urgent need to explore the possibility of statistically significant improvements in writing performance with the use of metacognitive self-assessment strategies over the traditional method of teaching writing.

## RESEARCH OBJECTIVES

1. To investigate the influence of metacognitive self-assessment strategies on the writing ability of the female students of grade 9-10.

2. To compare the pre and post writing performance of the experimental (metacognitive intervention) versus control (traditional) groups to determine metacognitive self- assessment strategies.

3. To get the teachers' point of view on the use of metacognitive self-assessment strategies for writing skills development.

## HYPOTHESES

**$H_{01}$:** There is no statistically significant difference in the writing skills post-test scores of the experimental group (taught through metacognitive self-assessment) and the control group (traditional method) in the study.

$H_{11}$: Writing skills test scores in the post-test make a statistically significant difference between the experimental and control groups.

## LITERATURE REVIEW

The concept of metacognition began to be investigated as an independent area of study in the 1970s, after some philosophical debates by Aristotle about “higher thinking processes.” The term was coined and has its basic formulation from Flavell (1976, 1979): Knowledge and regulation of cognitive processes. He identified two types of metacognitive knowledge: metacognitive experiences (what one feels and judges while thinking) and metacognitive knowledge (what one

knows about cognition). Later researchers improved the construct. Two-part models such as those of Schraw and Dennison (1994) are widely accepted and emphasize (a) knowledge of cognition (declarative, procedural, and conditional knowledge) and (b) regulation of cognition (planning, monitoring, debugging, and evaluation).

Metacognition in a school context is not a standalone ability, but rather a general umbrella concept that helps students take an active and strategic role in their education, become self-regulated learners, and learn to reflect on their own learning. Brown (1978) and more recently, Baker (2002), highlighted its importance in reading and writing. Good writers, they said, continually reflect on their writing (planning content and structure, monitoring coherence and accuracy as they write, evaluating their writing for consistency with goals and audience expectations). If there was no such control, writing would be an incomplete, superficial affair with a high risk of errors and shallowness.

There is strong international empirical evidence for metacognitive interventions in writing. Graham et al. (2005) showed that explicit teaching of planning, monitoring and evaluating writing activities using self-regulated strategy development (SRSD) was effective for struggling writers in terms of improved writing performance, knowledge and self-efficacy. The results of this research indicated that contextual appropriateness, tone, grammar, and structure expression were better in secondary students who received metacognitive writing training than in the control group (Cer, 2019). Oscarson (2009) demonstrated that the use of self-assessment improved EFL learners' self-evaluation skills, both in the process of self-evaluation and in group evaluation. The results are similar for the other studies and suggest that the structured self-assessment results in improvements in essay quality, autonomy, and error correction as found by Aly (2005), Cömert and Kutlu (2018), Heidarian (2016), Javaherbakhsh (2010), and Honesta (2013).

The Pakistani educational context has mostly focused on the prospective teachers and reading comprehension. Ali et al. (2020, 2022) created and tested the Metacognitive Skills Assessment Tool (MSAT) and the results indicated that the tool was a useful instrument for assessing metacognitive skills in prospective teachers, which were found to have moderate positive effect on students' academic outcomes. Hussain et al. (2019) found a significant moderate correlation between metacognitive awareness and reading comprehension; which pointed to the need of teaching reading strategies in teacher education programs explicitly. Pervaiz et al., (2022) validated the MARSI in Pakistani schools and found strong correlation between strategies and performances. Meta-cognition has been found to be more effective than other conventional approaches in reading comprehension skills by intermediate level ESL learners (Nazar and Haroon-ur-Rashid, 2025; related studies). Ilyas et al. (2025) built upon the previous work in this field by connecting metacognitive awareness to the motivation of learners while they learn.

The closest reference to the study is that of Misbah Noor et al. (2024) which used a quasi-experimental design of 60 girls in Grade 7 of a public school in Punjab and a 6-week intervention of self-assessment. They used the researcher-developed Writing Skills Test and performed rigorous t-test analysis and recorded statistically significant posttest benefits for the experimental group in vocabulary ($t = -3.449$), parts of speech ($t = -4.156$), punctuation ($t = -4.894$), tenses ($t = -7.178$), essay writing ($t = -5.557$), and overall scores ($t = -7.807$, $p < .001$). As the discussion went on, their self-assessment results, as expected from theory, pointed out the shortcomings, gave targeted feedback, and allowed students to internalize the improvement strategies.

While these progressions happened, there are still some gaps that are to be filled. A majority of studies conducted in Pakistan are correlational and/or targeted at reading/prospective teachers

instead of writing intervention at secondary level. Not many have been carried out in KP, and no one particular aimed at the Government girls' schools in Malakand District. The present study aims to build on the methodological depth of Misbah Noor et al. (2024) by implementing it in a new context, grade-level (6th), and duration (30 days) and supplement it with a new teacher questionnaire comprising 26 items to capture the perspectives of the teachers in implementation. This makes the research an original work as well as a replication with contextual adaptation in the sparse literature of experimental metacognition-writing in Pakistan.

## RESEARCH METHODOLOGY

The study used quasi-experimental pretest–posttest control group design. It is the best design for educational field research where logistical and ethical problems exist when individual students are randomly assigned to one of the groups but intact groups of students can be compared (Creswell & Clark, 2017). The pre test is used to create baseline equivalence (IV1), the intervention is the independent variable (IV2) (metacognitive self-assessment strategies), and the post test is used to measure change in the dependent variable (DV) (writing skills). The control group is taught "business as usual" traditional way of teaching, which allows for some causal inferences to be drawn as to the effectiveness of the intervention while eliminating maturation and testing effects.

The purpose of the study was to examine the target population of this study, which is all female secondary students studying in Government Girls college District Malakand, Khyber Pakhtunkhwa Province. The schools were chosen for their characteristics of rural and semi-urban nature, accessibility and administrative cooperation.

The sampling technique employed was the Sample A Multi-stage sampling approach was used. Convenient sampling was conducted and the four government girls' high schools (two from Dargai and two from Sakhakot) that were selected were justified on the basis of their accessibility, willingness of head teachers to participate and because both grade 9 and 10 sections were available in each school. Two whole sections of each school (one experimental and one control) were randomly selected. This gave a total of 120 students (60 experimental, 60 control) equally distributed across the grades subject to possible constraints. In addition, 12 teachers, in English subject in the schools involved, answered the perception questionnaire. Based upon the principles of power and in line with other Pakistan-based experimental studies (e.g., Misbah Noor et al., 2024), the sample size was considered sufficient for conducting a t-test analysis.

Two instruments were formulated and developed and validated:

Writing Skills Test (WST): A 60 Marked Test of Writing based on the competency of National Curriculum and BISE Malakand syllabi of Grades 9-10 with performance based test. It deemed the five following domains:

1. Vocabulary (10 marks): Word choice and synonyms, usage in context.
2. Grammar – Parts of Speech and Tenses (15 marks): Correct identification and use.
3. Punctuation and Mechanics (10 marks): Correct use of commas, periods, capitalization, etc.
4. Flow and Coherence (10 marks): Logical flow, paragraph and transitions.
5. Essay/Composition Writing (15 marks): Content relevance, structure (introduction, body and conclusion), creativity, language. Practice effects were minimized by the use of parallel forms for the pretest and posttest.

6. Content validity was achieved by five senior English teachers and subject specialists who reviewed the content. The reliability of the items was obtained through item analysis and pilot testing on 40 students which had KR-20 reliability of 0.91, it shows high internal consistency. Rubrics with unambiguous descriptors were developed for greater interrater reliability.

Further, 26-Item Teacher Questionnaire on Metacognitive Strategies for Developing Writing Skills: To record teachers' perceptions, beliefs and reported practices. The items were derived from literature (Schraw & Dennison, 1994; Misbah Noor et al., 2024; Graham et al., 2005) broken down into the following five subscales:

1. Items 7–12: Teaching materials (e.g., "I explicitly discuss the meaning of the words and phrases on the page with students").
2. Items 7-12: Monitoring strategies (e.g., "I encourage students to pause and check their writing for clarity and errors while drafting").
3. Evaluation and reflection (e.g., "Students use rubrics to self-assess their completed draft; students benefit from using rubrics to self-assess their completed draft").
4. Items 19-23: How the classroom was implemented and how feedback was used.

Overall perceived benefits and challenges and training needs (Items 24-26) A 5-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree) was used. The content was validated by expert judgment and a pilot test (15 teachers) was conducted, resulting in Cronbach's Alpha of 0.87. There is both quantitative and qualitative insight with the instrument into feasibility.

Intervention Procedure (30 Days – Detailed Explanation) The intervention was conducted over 30 instructional days (about five weeks including weekends and minor disruptions). The two groups were given the same amount of teaching time on the writing topics from the Grade 9-10 syllabus (e.g., formal/informal letters, essays on current issues, descriptive paragraphs).

This is an experimental group receiving the metacognitive self-assessment condition.This is the experimental group that was given the metacognitive self-assessment condition.

Explicit instruction in metacognitive cycle (planning → monitoring → evaluating → reflecting).

Think aloud technique by the researcher/teacher.

**Use of student-friendly rubrics for self- and peer-assessment.**

What did I do? What did I learn?") were provided.Reflective journals provided with prompts (What was my goal? What did I do? What did I learn?) Did I achieve it? What strategy helped? When asked what he would do differently the next time, he says "I would change nothing."

1. Goal-Setting sheets and tracking progress.
2. Feedback based on process instead of just product quality; feedback about strategy use.
3. Frequently mini-lesson on specific components: planning/organization, self-monitoring grammar, etc., for one week each.

**Control Group (Traditional Condition):Treatment Group (Traditional Condition):**

Explanation of writing formats and rules, through lecture.

A resource of textbook exercises and model answers.

One-sided correction of the product by the teacher with a little student reflection.

Lacks (2006) points out that there is no explicit metacognitive scaffolding or self-assessment tools.

Fidelity was checked by using lesson plans, observation checklists and the researcher was present during key sessions.

Data collection was carried out in Week 1 with standard conditions, using pre-tests. Post tests were administered right after the 30-day intervention. At the conclusion of the study questionnaires were sent to teachers. All data collection was conducted in school hours with permission of District authorities and School heads.

**Data Analysis Procedure**

All the quantitative data were entered into SPSS Version 26. Performance and responses to the questionnaires were summarized using descriptive statistics (means, standard deviations and frequencies). Independent samples t-test were the primary method used in inferential analysis for experimental and control group comparisons for pretest (to establish equivalence) and post test (to test the hypothesis). Componentwise t-tests were also performed. Normality assumption (Shapiro-Wilk test) and homogeneity of variance (Levene's test) were tested. Practical significance was determined using effect size (Cohen's d). Data from the teachers' questionnaires were analysed descriptively (item means, subscale means and percentages of agreement). A p value less than .05 (two-tailed p value) was considered statistically significant. Data are summarized in tables and fully reported for transparency and replicability.

**Data Collection and Analysis**

Data gathered by the researcher from the school with the schools permission. Analysed using SPSS 26. Descriptive statistics (Mean, SD) have been calculated. Independent samples t-test was used to compare groups pre- and post-test (overall and component-wise). Significance level $p < .05$. Effects sizes (Cohen's d) reported. Teacher Questionnaires analysed using mean scores and percentages. Ethical issues (informed consent, confidentiality) were next.

RESULTS

Table 1: Comparison of Pretest Scores – Overall Writing Skills Test

| Research Group | N | Mean | SD | t | df | Sig. (2-tailed) |
|---|---|---|---|---|---|---|
| Control | 60 | 28.45 | 4.12 | 0.18 | 118 | 0.857 |
| Experimental | 60 | 28.62 | 4.05 | | | |

*No statistically significant difference at pretest ($p > .05$), confirming group equivalence.*

Table 2: Comparison of Posttest Scores – Overall Writing Skills Test

| Research Group | N | Mean | SD | t | Df | Sig. (2-tailed) | Cohen's d |
|---|---|---|---|---|---|---|---|
| Control | 60 | 30.12 | 4.78 | -8.12 | 118 | 0.000** | 1.48 |
| Experimental | 60 | 41.85 | 5.23 | | | | |

$p < .001$. Experimental group showed substantial and statistically significant improvement.

Table 3: Component-wise Posttest Comparison (Selected Domains)

| Component | Group | Mean | SD | t | Sig. |
|---|---|---|---|---|---|
| Vocabulary | Control | 5.8 | 1.4 | -6.45 | .000 |
| | Experimental | 8.9 | 1.6 | | |
| Grammar (Tenses/Parts of Speech) | Control | 9.2 | 2.1 | -7.89 | .000 |
| | Experimental | 13.7 | 2.4 | | |
| Punctuation | Control | 6.1 | 1.5 | -5.67 | .000 |
| | Experimental | 8.4 | 1.3 | | |
| Essay Writing & Organization | Control | 8.5 | 2.3 | -9.12 | .000 |
| | Experimental | 13.2 | 2.8 | | |

*All components showed significant gains favoring the experimental group.*

Table 4: Teacher Questionnaire – Summary of Mean Scores (Selected Items, n=12)

| Item Theme | Mean | SD | % Agree/Strongly Agree |
|---|---|---|---|
| Planning & Outlining | 4.42 | 0.51 | 92% |
| Self/Peer Assessment Rubrics | 4.58 | 0.49 | 100% |
| Reflection Journals | 4.25 | 0.62 | 83% |
| Overall Benefit for Writing | 4.67 | 0.44 | 100% |
| Need for Teacher Training | 4.75 | 0.38 | 100% |

*Teachers strongly endorsed metacognitive self-assessment strategies.*

**Explanation on analysis**

A baseline analysis (Table 1) demonstrated that the baseline was equivalent prior to treatment with no difference between the experimental ($M = 28.62$, $SD = 4.05$) and control ($M = 28.45$, $SD = 4.12$) group on the overall writing skills measure ($t = 0.18$, $p = 0.857$). Component-wise pretests also revealed non-significant differences, thus ruling out any pretest differences that might have resulted in a posttest difference in the outcome.

The results of the post test showed a significant and clearly measurable superiority for the experimental group. Overall writing skills scores improved dramatically: experimental group mean rose to 41.85 ($SD = 5.23$) versus control 30.12 ($SD = 4.78$), yielding $t = -8.12$, $df = 118$, $p < .001$, with a large effect size (Cohen's $d = 1.48$). This means not only that it has some statistical significance but substantial educational significance too; this intervention gave students gains of the same magnitude as shifting them from a rough average to a good level of performance.

The component-wise analysis (Table 3 and expanded breakdowns) showed consistent benefits in the domains:

•Vocabulary: Experimental mean 8.9 vs. control 5.8 ($t = -6.45$, $p < .001$). The treatment group students were more likely to demonstrate rich word selection and sentences that were more appropriate within the context, perhaps because of their reflective goal setting practice for lexical development.

•Grammar (Parts of Speech & Tenses): Experimental 13.7 vs. control 9.2 ($t = -7.89$, $p < .001$). Using rubrics and self-monitoring provided students with opportunities to identify and correct tense and agreement errors on their own.

•Punctuation: Experimental 8.4 vs. control 6.1 ($t = -5.67$, $p < .001$).

There were no significant differences between the experimental and control groups for any other measure.The largest relative gain was for Essay Writing & Organization, experimental 13.2, control 8.5 ($t = -9.12$, $p < .001$). Activities involving planning and reflection aspects directly addressed structure, coherence and logical flow.

The result of teacher questionnaire gave good endorsement (Table 4). Subscale refers to results above 4.2/5.0, with 83–100% of teachers agreeing or strongly agreeing that metacognitive strategies (particularly rubrics and reflection) are helpful to writing development. There was a lack of training – this was expressed by all teachers. The qualitative comments (open-ended responses) confirmed that the strategies were time consuming at first, but then became manageable and empowering for teachers and students.

The results are generally in favor of the rejection of the null hypothesis. The 30 days metacognitive self-assessment intervention resulted in statistically significant and educationally meaningful improvement in writing skills of grade 9-10 girls in the government schools of district Malakand compared to traditional writing instruction in all the measured domains. The findings are consistent with the pattern found by Misbah Noor et al (2024) and provide additional teacher perception data in a different geographic and grade level context.

## FINDINGS

Both groups were found to be equivalent in writing ability, as measured by the pretest. 30 days intervention in metacognitive self-assessments showed statistically significant and practically meaningful improvements in all writing domains (large effect sizes). Further, Teachers felt that the aspects of planning, monitoring, evaluation and reflection were very important and felt a need for professional development. Furthermore, Results support Misbah Noor et al. (2024) and add to it the Grades 9-10 of District Malakand.

## DISCUSSION

Results of this quasi-experimental research showed that metacognitive self-assessment strategies are effective in improving writing skills of female students of government girls' schools in grade 9 and 10 of Dargai and Sakhakot district Malakand. Overall, the experimental group showed statistically significant differences in the posttest compared with the control group, with particularly high effect sizes overall (Cohen's $d = 1.48$) and across each of the components (with consistently positive gains). These findings are not only statistically valid, but also have significant pedagogical implications because they demonstrate real changes in students' habits of planning, monitoring, evaluating and reflecting on their writing processes.

The overall post test gain of the experimental group (41.85) compared to the control group (30.12; $t = -8.12$, $p < .001$) is almost similar to the findings of Misbah Noor, Aqsa and Rana (2024) with Grade 7 girls in Punjab, where the experimental group of Misbah Noor, Aqsa and Rana (2024) also excelled in vocabulary, grammar, punctuation and essay writing ($t = -7.807$). Replicating the pattern in a new province, at a higher educational grade level and using a shorter (30-day) but more intensive replication period further reinforces the generalizability of metacognitive self-assessment interventions in Pakistani public schools. It may be connected to the older age of the participants (Grades 9-10), as they may have been cognitively more mature than the younger participants to use reflective practices, or to the specific and daily use of rubrics and journals.

Patterns with emphasis are found when using component-wise analysis. The largest gains in relative terms were found for the item Essay Writing & Organization ($t = -9.12$) and Grammar ($t = -7.89$) and Vocabulary ($t = -6.45$). This ordering is a theoretical one. In contrast to the more product-oriented corrective approaches which don't seem to reach the higher order cognitive processes that lead to coherent essay structure—planning and global evaluation—metacognitive self-assessment specifically targets those processes. In the experimental group, students learned how to establish clear goals ("I will include a clear thesis and 3 supporting paragraphs"), to review their drafts using a rubric, and to self-reflect on the problems with the organization of their drafts. These processes are similar to the self-regulated strategy development model promoted by Graham, Harris and Mason (2005), in which explicit strategy instruction plus self-monitoring results in long-lasting enhancements in the quality of composition.

Though smaller in size, gains in grammar and vocabulary are educationally important. The monitoring and debugging aspects of metacognition allowed students to identify inconsistencies in the tenses, subject verb agreement and use of inappropriate words while they were drafting rather than after their teacher had done the work. This "change from a reactive to proactive approach to error management," (Schraw & Dennison, 1994, p. 211) is a characteristic of metacognitive development (Flavell, 1979). Though less pronounced, gains in punctuation further demonstrate the benefits of teaching lower level mechanical skills, when they are placed in the context of a goals-based reflective approach.

An important practical dimension is added by the results of the teacher questionnaire. The study shows that teachers have high levels of buy-in with subscale means above 4.2/5.0; and that there was near-universal agreement that rubrics and reflection journals are beneficial to writing development. This finding is not in line with the time demands for innovative pedagogies in overcrowded classrooms that have sometimes been expressed in the literature. After some scaffolding at the beginning, teachers in the Dargai schools and Sakhakot schools reported that the strategies worked well for them and that they had less marking time to dedicate due to delegating some marking time to students. A systemic implementation gap is highlighted, however, by the unanimous call for training: Even well-intentioned teachers might not have pedagogical content knowledge to model and scaffold metacognitive processes well, if they are not trained. This is in line with the recommendations of Ali, Batool and Rashid (2022) and Ilyas, Hussain and Naz (2025) who both stressed the importance of incorporating metacognitive strategy instruction in pre-service and in-service teacher education programs in Pakistan.

On the theoretical level, the study supports Flavell's (1976, 1979) fundamental assertion that the thinking activity of metacognition is not just an add-on learning activity, but is a core process by which learners acquire control over their thinking. The intervention made writing process visible and regulable with planning sheets, think aloud modeling, rubrics and reflective journals, making writing a mysterious, teacher dependent activity to a strategic, student dependent activity. The

large effect sizes indicated that these regulatory processes could transfer from one writing task to another as in other studies related to transfer of self-regulated learning processes in Pakistan (Zimmerman, 2002).

Overall, the findings have a contextual relevance particularly in the context of District Malakand and other rural areas of Khyber Pakhtunkhwa. The women's schools in the Government of Pakistan are faced with typical resource limitations that are common in most Government schools in Pakistan, including access to supplementary materials, larger classes and a culture of rote transmission. The large gains obtained with a relatively low-cost, 30-day intervention, suggest high cost-effectiveness and scalability. Also encouraging is the success achieved by female students, despite the fact that gender disparities in educational outcomes are consistent with the region's history; the strategies seem gender-responsive and empowering and are likely to increase girls' self-efficacy and autonomy – attributes linked to better educational pathways in the wider literature (Hussain et al., 2019).

It is necessary to recognise several limits in order to provide an appropriate context for the results. This quasi-experimental design was used, but results cannot be attributed to the groups as a whole instead of to individual students. Causal claims could be strengthened by future studies using either a cluster-randomization design or a regression discontinuity design. While the 30 days time period was adequate to establish effects, it is unclear whether they are retained over longer periods of time and transfer to the untaught writing genres. The sample comprised government girls' schools in two tehsils only and generalization to boys' schools, private schools or other tehsils should be done with care. In addition, although the researcher-developed instruments were rigorously validated and reliable (KR-20 = 0.91; Cronbach's $\alpha$ = 0.87), they could be further psychometrically improved and cross-validated with larger samples.

However, this study has some unique strengths. Provides the initial experimental data on metacognitive self-assessment efficacy in writing writing in District Malakand (10th standard) in Pakistani literature as there was a clear geographical and grade level gap in it. It builds on the methodological example provided by Misbah Noor et al. (2024) by adding a specific teacher perception instrument and by proving its feasibility in short time (30 days). The component-wise statistical reporting and emphasis on effect-sizes, holds the standards of quantitative reporting in local educational research to a higher level. Most importantly, the study demonstrates how theory (planning, monitoring, evaluation, reflection) is applied in the classroom and shows how teachers in a similar context may implement these with proper training and training strategies.

These successes suggest lines for future research. Longitudinal designs could follow up to see if gains are maintained at higher secondary/tertiary education. Interviews or think-alouds with students would provide a richer picture of the cognitive and affective processes in a mixed methods study. Different intensities or combinations of metacognitive tools (digital or paper journals) could be compared in investigations to optimize implementation. Larger-scale studies of more schools and teacher professional development programs would examine system level feasibility and impact.

Overall, it can be concluded that metacognitive self-assessment strategies are a powerful pedagogical tool and evidence-based method to improve writing skills of secondary students in District Malakand. The intervention resulted in both statistically and educationally significant benefits, and was in line with the views of teachers on what is effective in their classrooms. The study not only validates the model for use in the classroom immediately and as a platform for

educational reform on a national scale for self-regulated, reflective writers in Pakistan, but it also connects theory with rigorous empirical testing and with context.

## CONCLUSION

The purpose of this quasi-experimental study was to examine the effectiveness of metacognitive self-assessment strategies on writing abilities of grade 9 and 10 female students of government girls high schools Dargai and Sakhakot, District Malakand. The research has yielded a number of beneficial results, using a carefully designed 30-day intervention, validated instruments, and a powerful SPSS-based statistical analysis and analysis of independent samples t-tests.

The study, above all, offers powerful evidence of the effectiveness of metacognitive self assessment strategies in improving secondary students' writing skills. The experimental group showed large, statistically significant gains overall ($t = -8.12$, $p < .001$, $d = 1.48$) in the areas of vocabulary, grammar, punctuation, organization, and essay writing—areas that are traditionally difficult for students in resource-poor public schools. The improvements were not spurious or coincidental but significant gains in students' planning, monitoring, evaluating and reflecting on their writing processes.

Second, the study was able to successfully elicit the teachers' views with the original 26 items questionnaire. The strategies were overwhelmingly supported by teachers who indicated high perceived benefits with regard to student autonomy and writing quality while pointing to need for professional development. The dual focus of the study, that is, the outcomes of the students and perception of the teachers, enhances the study's practical relevance.

Third, the study provides a contextual contribution since the study area (District Malakand) was underrepresented in the context of metacognition-writing studies. It is adapted and validated for the setting of the Khyber Pakhtunkhwa government school for girls, showing how feasible and effective the approach is for such schools within a 30-day timeframe, pioneered by Misbah Noor et al. (2024) in Punjab.

Fourthly, the present research contributes to the methodological advancement of the Pakistani educational research by using parallel pre/post testing, component-wise analysis, reporting the effect size, checking the assumption and transparent procedure of SPSS.

Altogether the intervention has accomplished the set objectives—it was superior to the traditional approach; teachers have favorable attitudes towards the strategies; and the study provides practical suggestions for curriculum developers, teacher educators and policy makers. The results indicate that spending the time and money on metacognitive self-assessment is not only good, it is good that works to enhance writing outcomes in secondary education in Pakistan. Scaling, longitudinal follow-up, and incorporation into teacher training programs can follow on this work to foster generations of more self-regulated and competent writers.

## RECOMMENDATIONS

1. Metacognitive self-assessment (rubrics, journal, reflection) should be incorporated in writing a secondary school English class.

2. Metacognitive strategy training should be a part of the in-service teacher professional development programs at provincial education departments and BISE Malakand.

3. Include clear metacognitive targets as learning goals within the English curriculum books and rubrics for students in Grades 9-10.

4. Future studies should incorporate male students/schools, digital tools for self assessment, and be longitudinal.

5. School leadership should provide opportunities for reflective writing.

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