

RESEARCH ARTICLE

Metacognitive writing strategies of Sri Lankan secondary school children

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Abstract: This study was conducted to identify metacognitive strategies used by secondary school children in the three stages of writing process, to identify their distribution within metacognitive strands and metacognitive fields, and to identify whether they differ according to rural / urban schools, grades and sex. 408 observation notes, written exercises from 278 Mother Tongue lessons, 289 interviews and responses to a questionnaire were collected from 678 Grade 6-10 students. Qualitative data were coded, frequencies calculated and differences between proportions were Z tested. Quantitative data were clustered and analyzed using Chi square and Factor analysis. Writing Stage is dominant in the Writing Process of Grades 6 -10 students of both sexes and in rural / urban schools. Planning and Revising stages are mixed with the Writing Stage. The Planning Stage is dominated by an explanation of the lesson by the teacher. Students do not show an awareness or regulation of metacognitive strategies in the Planning of Writing. Knowledge Telling Process can be found in the Writing Stage. Revising Stage is dominated by mechanical and surface level changes. There is a tendency towards a boy-girl dichotomy. Girls emphasize the Planning Stage whereas the boys emphasize the Writing Stage.

INTRODUCTION

Flavell (1976) first coined the term metacognition as “one’s knowledge concerning one’s own cognitive processes and products or anything related to them, e.g. the learning related properties of information and data”. He further describes metacognition as “the active monitoring and consequent regulation and orchestration of these processes in relation to the cognitive objects or

data on which they bear, usually in the service of some concrete goal or objective” (Flavell, 1976). There is a growing theoretical and practical interest in the topic of metacognition: how we monitor and control our own mental processes (Pintrich, 1999). Metacognition has made contributions to two applied domains, namely education, specially applications towards improving learning and training and legal contexts (Schwartz & Perfect, 2002). An important aspect of learning is using Cognitive and Metacognitive strategies to control and regulate students’ own learning.

Metacognition is a construct similar to Executive Decision Making Process of Information Processing System. Metacognition is also an aspect of Self-regulation. One of the schools of thought that has contributed to enhance the knowledge in the construct of Self-regulated Learning is ‘Metacognition and Regulation Styles’ (Boekaerts, 1999). Many research studies on Self-regulated Learning play a major role in understanding classroom learning processes and facilitating the intellectual development of the child, (Newman, 1990; Zimmerman, & Bandura, 1994; Schunk, & Zimmerman, 1994; Boekaerts, & Minnaert, 1999) centered on cognitive and metacognitive strategies such as mnemonic encoding and self-monitoring (Zimmerman, & Bandura, 1994). According to the constructivist viewpoint, the learner should have a control over his or her own learning because the responsibility is with him in sensitizing with the learning and the student needs cognitive and metacognitive knowledge and skills to do this successfully.

Although, as a new construct, the concept of Self-regulated Learning is embraced by policy makers, teachers, educationists and parents (Boekaerts, 1999), the research emphasis in Sri Lanka on the concept of

metacognition is not grounded and its application at classroom level is yet to be identified.

Metacognitive skills and strategies can be used in any subject area of school curriculum and in the thought processes of children such as attention, motivation, learning, memory, and understanding (Linn, 1986; Nickerson, 1986; Carrol, 1986).

Further, there are 'General metacognitive skills and strategies' that can be applied across different subject areas or mental processes and 'Specific metacognitive skills and strategies' that can be used in specific subject areas or mental processes. The present study focuses on a specific subject area, i.e. writing of secondary school children, which according to Scardamalia & Bereiter (1986a) has gained academic attention recently, although it had been neglected until now.

Four aspects of writing have been focused on in research literature on Writing and the present study focuses on the aspect of 'incidents and processes occurred in the mind during Writing in the classroom setting.

LITERATURE SURVEY

Metacognition

Based on the theoretical explanations (Flavell, 1976; Brown, & Smiley, 1977; Flavell, 1979; Brown, 1980; ; Cavanaugh, & Perlmutter, 1982; Meichenbaum, Burland, Gruson, & Cameron, 1985; Wellman, 1985; Beyer, 1987; Brown, 1987; White, 1988) two aspects of metacognition are delineated for the study. They are,

- Knowledge and awareness about cognitive behaviour/ processes and,
- Monitoring and controlling of such knowledge and awareness to regulate cognitive behaviour/ processes.

Learning strategies that display Knowledge, Awareness, Monitoring and Controlling have been identified by researchers in different subject areas and mental processes. According to Paris, Saarnio, & Cross (1986), the strategies are skimming, rereading, paraphrasing, and summarizing. Ellis (1986) cited planning, checking, testing, revising and evaluation as strategies. Baird (1986) cites confirmation of the topic, evaluation of knowledge, reviewing the structure of the message, extracting important sections, and evaluating outcome of learning as learning strategies. Moely, Hart, Santulli, Leal, Johnson, Rao, & Burney (1986) named

rehearsal, chunking, categorization, verbal elaboration, and note taking as general strategies. Weinstein, & Mayer (1986) categorize strategies into eight as basic rehearsal strategies, complex rehearsal strategies, basic elaboration strategies, complex elaboration strategies, basic organizational strategies, complex organizational strategies, comprehension monitoring strategies, and affective and motivational strategies.

In Sri Lanka, Gorrell, Dharmadasa, Kularatne, & Abeyratne (1996) found that older children in primary classes tend to use more complex strategies and younger children tend to use basic learning strategies. Use of strategies by children also differed according to the subjects being studied. Further, Sri Lankan primary school children function effectively and strategically in their classroom performances. Gorrell, Dharmadasa, & Dharmadasa (1999) studied learning strategies of self evaluation, organization and transformation, goal setting, planning, seeking information, self monitoring, adjusting environment, rehearsing, memorizing, seeking peer help, and seeking help from parents and teachers, used in problem solving.

Use of specific strategies in the writing behaviour is focused on in the present study. Hence metacognition is defined, for the purpose of this study as the knowledge, awareness and monitoring and the controlling of that knowledge and awareness, in using strategies for writing.

The present research focuses on the Writing Strategies, and 'knowledge and awareness' of children on the Writing Strategies and the 'monitoring, controlling, and regulating of such 'knowledge and awareness' in the three stages of the Writing Process: Planning, Writing and Revising.

Writing Process

Writing is a complex activity (Archibald, & Jeffery, 2000). It also has a recursive process. The present trend of research into the writing of children focuses on the process of writing rather than on the product of writing, and on the recursive nature of writing rather than the linear nature of writing (Rohman, 1965; Britton, Burgess, Martin, Mcleod, & Rosen, 1975; Hayes, & Flower, 1980; Flower, & Hays, 1981a; Graves, 1983; Murray, 1984; Bereiter, & Scardamalia, 1987; Moore, & Caldwell, 1993; Hayes, & Nash, 1996; Torrance, Thomas, & Robinson, 1999; Torrance, Thomas, & Robinson, 2000).

Although Planning, Composing and Revising stages are

overlapping in the Writing Process, they can be taken separately to facilitate description (Hartley, 1994).

An important time log of Writing should be focused on Planning Stage of Writing where the goal setting occurs (Murray, 1978; Flower, & Hays, 1980a; Moffett, 1982; Graves, 1983; Rohman, 1983). Goal setting is one important aspect of good writing (Page-Voth, & Graham, 1999).

During the second stage of Writing Process, i.e. the Writing Stage, ideas are translated into the written mode. The writer is expected to perform many tasks during this period and due to this, writing becomes an unusually complex task (Biggs, Lai, Tang, & Lavelle, 1999).

Revising which enhances the quality of an essay is a basic and important aspect of the Writing process (Murray, 1978; Scardamalia, & Bereiter, 1986a; Fitzgerald, 1987; Fitzgerald, & Markman, 1987; Graham, MacArthur, & Schwartz, 1995). Professional writers set apart considerable time for Revising (Hildick, 1965; Graham, MacArthur, & Schwartz, 1995).

Effective Revising results in good Writing (Murray, 1978; Bridwell, 1980). Many writers, however, revise little (National Assessment of Educational Progress, 1977; Scardamalia, 1981; Bartlett, 1982; Hull, 1987; Englert, Hiebert, & Stewart, 1988). They tend to be proof readers rather than reviewers whose role is to edit the document to suit a known audience (Sommers, 1980; Faigley & Witte, 1981).

In American Public Schools many children do not revise competently and effectively (Fitzgerald, & Markman, 1987; Fitzgerald, 1987; Graham, MacArthur, & Schwartz, 1995). They focus on mechanical and word-level changes (Bridwell, 1980; Faigley, & Witte, 1981; Scardamalia, & Bereiter, 1986a; Scardamalia, & Bereiter, 1986b; Graham, MacArthur, & Schwartz, 1995) and their Revising influences a little on the quality of Writing (Bracewell, Scardamalia, & Bereiter,

1978; Scardamalia, & Bereiter, 1986a; Scardamalia, & Bereiter, 1986b; Graham, MacArthur, & Schwartz, 1995). Their sense of audience is limited, resulting in less Revision (MacArthur, Schwartz, & Graham, 1991; Graham, MacArthur, & Schwartz, 1995). In Sri Lanka, a study on Metacognitive Writing is yet to be completed.

OBJECTIVES

The objectives of the research were to identify metacognitive strategies used by secondary school children (Grades 6-10) in the three stages of Writing Process, to identify distribution patterns of metacognitive strategies used by secondary school children within ‘metacognitive strands (Awareness and Regulation)’ and ‘metacognitive fields (Generating ideas, Goal setting, Organization, Self monitoring and Self evaluation)’; to identify the nature of their knowledge/ awareness and monitoring / regulation of metacognitive strategies and to identify whether the metacognitive strategies used differ according to the type of school (rural / urban), grade (6-10) and sex (boy / girl). Figure 1 shows the conceptual model of the study.

METHODOLOGY

The sample comprised 725 children (Male = 363; Female = 362) of Grade 6, 7, 8, 9, and 10 from four purposively selected schools (Urban = 2; Rural = 2). A sub sample of 120 children was used to collect 408 observation notes and written exercises as classroom artifacts. They were collected from 278 Mother Tongue lessons by 12 data collectors, including the researcher. Two hundred and eighty nine interviews were conducted with the children focusing on their writing behaviour (Table 1).

Based on the data collected from the sub sample of 120 children, a questionnaire was developed to collect data from the sample of 725 students.

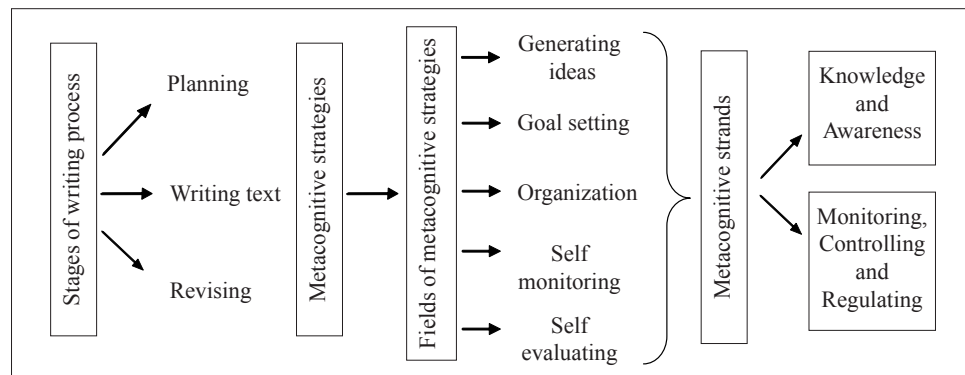


Figure 1. Conceptual model of the study

Table 1: Mother Tongue lessons (Interviews and Observations)

School	No. of observed lessons						No. of interviews					
	6	7	8	9	10	Total	6	7	8	9	10	Total
A	16	19	20	16	17	88	22	19	30	22	16	109
B	22	17	16	11	21	87	15	13	15	20	19	82
C	9	12	9	9	11	50	12	12	8	6	6	44
D	10	10	10	13	10	53	12	11	8	19	4	54
Total	57	58	55	49	59	278	61	55	61	67	45	289

Observation and interview data, qualitative in nature, collected from 120 children were transcribed, coded and frequencies were calculated according to the Stages of writing (Planning, Writing, Revising), Metacognitive strategy fields (Generating ideas, Goal setting, Organization, Self monitoring and Self evaluation), Metacognitive strands (Awareness and Regulation) and 72 Metacognitive strategies. Differences between proportions of frequencies were tested using z test. In the reporting of findings, extracts of classroom artifacts, observations and interviews were quoted as qualitative examples.

The quantitative data derived from the questionnaire, that were used to study the generalizability of patterns identified from 120 students, were analyzed using 'Hierarchical tree cluster analysis' to identify speculative

patterns, 'Chi square test' to identify confirmed patterns and 'Factor analysis' to identify specific patterns.

Delimitations and Limitations

The study focused on writing activities performed as a part of curriculum implementation in the selected grades. Specifically designed writing activities by the researcher were not used since the objective was to identify metacognitive strategies in writing in the natural classroom setting. A secondary grade, Grade 11 was not included due to its exam oriented writing behaviour.

Only 604 children responded to the questionnaire, due to the involvement of the other children in pre assigned school activities (Table 2).

Table 2: Student responses to questionnaire

Environment of school	Sex of the child	Grades				
		6	7	8	9	10
Rural	Boys	35	38	38	29	32
	Girls	26	33	32	30	27
Urban	Boys	36	53	24	41	24
	Girls	16	23	20	28	19
Total	Boys	71	91	62	70	56
	Girls	42	56	52	58	46
Total		113	147	114	128	102
Grand Total		604				

Ethical Considerations

The consent of school principals and teachers was obtained for the research on the assurance that classroom and school activities would not be affected.

DATA PRESENTATION AND DISCUSSION

1. Patterns Emerging from sub sample

1.1 Time taken for each stage of writing process: the content analysis

It could be identified that there were two sub periods in Mother tongue lessons, the time taken by the teacher to teach and the time taken by the student to write. The average percentage of time in which, 120 children of the sub sample engaged in the writing during their observed 278 Mother Tongue lessons was 60%

(Rural 67%, Urban 54%). Gradewise percentages were 58% (Grade 6), 58% (Grade 7), 67% (Grade 8), 62% (Grade 9), and 56% (Grade 10) (Table 3).

During the observation of Writing activities by 12 observers, children entered into the Writing stage of the Writing process in 408 instances. Out of the 408 instances, Planning stage of the Writing process was observed in 19% of the instances (Rural 17%, Urban 21%) and Revising in 12% of the instances (Rural 5%, Urban 21%). The main reason for the less time period for Revision was the limited 40 minute time period for lessons. During the Writing stage, however, children engaged in Planning in 65% of the instances (Rural 62%, Urban 67%) and in Revising in 75% of the instances (Rural 68%, Urban 82%). Hence, Writing stage was dominant in the Writing Process of male and female students in both urban and rural schools and in Grades 6-10 students. Rather than being in two separate stages, Planning and Revision were mixed in the Writing stage, because children tended to plan and revise while Writing.

Table 3: Relative time spent on each stage of writing

Grade	6		7		8		9		10		Grand total	
	Time											
School	Lessons: Minutes	Writing: Minutes	Lessons: Minutes	Writing: Minutes	Lessons: Minutes	Writing: Minutes	Lessons: Minutes	Writing: Minutes	Lessons: Minutes	Writing: Minutes	Lessons: Minutes	Writing: Minutes
Sch. A	537	334	659	352	684	404	491	424	584	373	2955	1887
Sch. B	652	456	880	472	941	798	627	449	543	379	3643	2554
Rural Total	1189	790 66%	1539	824 54%	1625	1202 74%	1118	873 78%	1127	752 67%	6598	4441 67%
Sch. C	640	346	770	545	827	597	547	292	725	297	3509	2077
Sch. D	727	344	867	460	851	418	1032	499	704	378	4181	2099
Urban Total	1367	690 50%	1637	1005 61%	1678	1015 60%	1579	791 50%	1429	675 47%	7690	4176 54%
Total	2556	1480	3176	1829	3303	2217	2697	1664	2556	1427	14288	8617
Grand Total		58%		58%		67%		62%		56%		60%

1.2 Metacognitive strategies used in each stage of the Writing Process: Observation data

When the notes taken during the lesson observations were translated into graphs (Fig. 2 & 3) to accentuate patterns, the relative expansion of stages of writing could be further identified. In the graphs, the process of writing of children were depicted through signs which are cited below the Fig. 2 as a key. In some places of the graphs, to highlight the stages of writing process, words have been written using English phonetic scripts. As an example in the Fig. 2 Sinhala word ‘vividā’ (English meaning = various) is written as ‘vividā’.

According to the patterns in the graphs, children did not spend time for Planning and right away started writing. During the explanation of lessons by teachers, only three children ‘took notes independently’ by way of writing the meaning of difficult words, showing the metacognitive regulation behaviour. During the explaining of lessons, however, mental metacognitive

strategies of ‘identifying the necessity for writing’, ‘knowledge on the specific task and task difficulty’, ‘using prior knowledge’ and ‘identifying the goal of writing’ were emerging in the minds of the children. Children tend to begin writing at once as the teacher wants them to start writing, based on this basic conceptual springboard. Major parts of graphs are dominated by the Writing Stage of the Writing Process indicating the importance children place on the Writing Stage. Hence a Writing Stage dominated Writing Process could be identified. As revision is not a separate section of the Writing Process, it mixes with the Writing Stage. Accordingly, children revised while writing the text, not after finishing the text. Hence, a recursive process of writing could be identified. Further, their revisions were limited to mechanical revisions i.e. Writing on the letters to have them clearer, preparation of vowel sounds, colouring letters to make them prominent and making surface level changes of the text i.e. Striking off written words, writing new words, writing correct letters / words for incorrect ones.

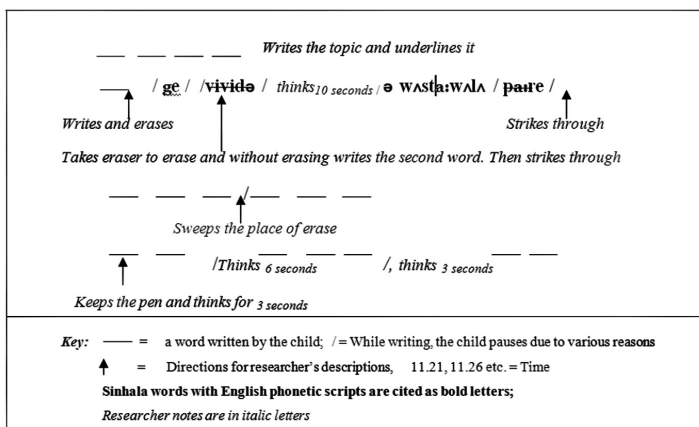


Figure 2: Graph showing the flow of writing of child A65F

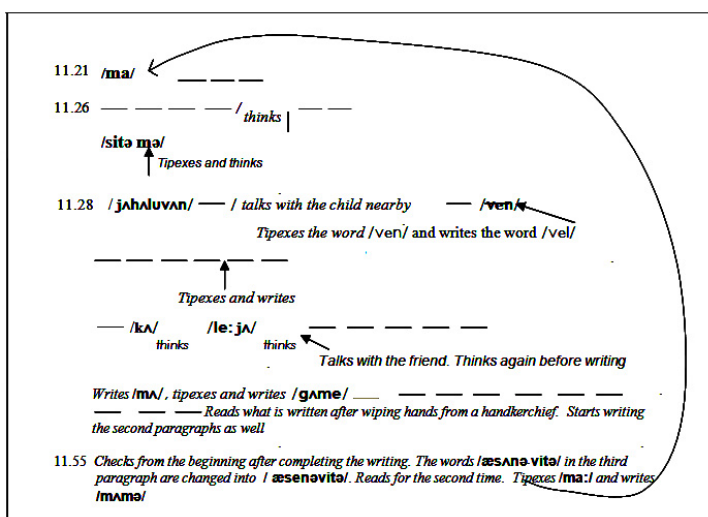


Figure 3: Graph showing the flow of writing of child A66F

1.3 Metacognitive strategies used in each stage of the Writing Process: Analysis of qualitative data

The writing stage which dominated the writing process could also be identified from the extracts of interview data.

1.3.1. The Planning of Writing

The Planning of Writing is mainly a mental process that could not be visible through external behaviours, i.e. preparation of drafts, taking notes. Only four children out of 120 used drafts for writing during the observations. The ideas expressed in interviews by children (I thought a little, I thought about this piece of writing and then wrote, memorized what the teachers had taught us and wrote, I recollected facts) show the mental Planning for Writing.

Children do not show awareness or regulation of metacognitive strategies in the Writing process (Fig 4 & 5). The obvious metacognitive strategy that was not used in Planning was 'Goal setting' (Fig 6 & 7). Out of the 40 metacognitive strategies related to Planning of Writing: 'memorizing relevant facts', 'using prior knowledge', 'reading to collect information', 'seeking information', were used by the children.

Researcher	: You did not write anything during the teacher's explanation. Did you?
Student	: Yes
Researcher	: Why didn't you write while the teacher was explaining?
Student	: We do not do it other days also
Researcher	: So, you just listen. Don't you? Can you remember all the facts teacher explains? Don't you forget?
Student	: I forget some facts.
Researcher	: Then why don't you take notes?
Student	: No Answer

Figure 4: An extract from an interview with the child B105F

Researcher	: Did you have a plan at the beginning of the writing?
Student	: Yes, first we have to introduce.
Researcher	: Then
Student	: No answer
Researcher	: When you started writing did you have an idea about the length and the content of the essay?
Student	: No such thing. I kept important facts in my memory.

Figure 5: An extract from an interview with the child

Researcher	: Did you decide that you were going to write this much of facts?
Student	: No
Researcher	: Did you think of writing a little?
Student	: No
Researcher	: Then why did you write a little?
Student	: While I was writing I had no idea about my piece of writing. While writing I thought this much would be enough.

Figure 6: An extract from an interview with the child A65F

Researcher	: Did you write this dialogue using your memory?
Student	: No, I just wrote the ideas that came into mind at that time.
Researcher	: Didn't you write what the book mentioned?
Student	: I took one episode and wrote one conversation and then thought about the next conversation later. I thought about the beginning but not about the end of the dialogue.
Researcher	: Do you have the whole story in your mind?
Student	: No. I take one incident and expand it. I write one and then think about the next thing to be written. After writing one word, think about the next word.

Figure 7: An extract from an interview with the child B102M

Analysis of interview data in relation to five metacognitive fields reveals the fact that the field of goal setting was weak during the Planning Stage.

1.3.2 The Writing Stage

Absence of Planning Stage, results in a Writing Stage where children tend to write what they have in their minds at the moment of writing. The unawareness of the writing task in the Writing Stage also surfaced (Fig 8).

Researcher	: The teacher asked you to write LIYO. But you have written Lio. Why?
Student	: Madam, I forgot it. I was not aware

Figure 8: An extract from an interview with the child B83M

Children entered the Writing Stage with ‘awareness on the present cognitive status’ and they had the awareness of the ‘ongoing writing activity’. ‘While writing they thought about the writing’ and ‘took decisions on paragraphing and organizing the written work’. Due to this metacognitive awareness during the Writing Stage, they could identify the places where revisions were necessary and edit the written work accordingly (Fig. 9).

Researcher	: You wrote the words “Parakrama Samudraya” and thought for a while. Why?
Student	: I thought whether it was right.
Researcher	: Why did you cut a word in the fourth line of the third paragraph?
Student	: I thought about a better word

Figure 9: An extract from an interview with the child B95F

Although metacognitive regulation strategies of ‘transformation of content of the piece of writing to produce a better product’, ‘thinking about the writing task and as a result self monitoring’, and ‘reflecting on the writing task’ could be found in some of the children who were in the Writing Stage of the Writing Process, as a whole, there exists a ‘knowledge telling behaviour’ rather than a ‘knowledge transformation behaviour’ proving the theory of writing suggested by Scardamalia & Bereiter (1986ab) (Fig 10, 11 & 12).

Researcher	: How did you think about writing in this way?
Student	: While I was writing facts it came into my mind. Hence I wrote in that way.
Researcher	: That means you do not think about the things you are going to write at the beginning, at the middle of the essay and at the end of the essay?
Student	: Yes

Figure 10: An extract from an interview with the child C66F

Researcher	: I saw you striking off a word here
Student	: First of all I began to write this sentence. Afterwards this word came into my mind. Hence I wrote that word.

Figure 11: An extract from an interview with the child D95F

Researcher	: That means you think before you write?
Student	: I keep on writing and if the facts do not come into my mind I stop writing.

Figure 12: An extract from an interview with the child B103M

When the interview data were analysed according to five metacognitive fields, the field of generating ideas seemed to overlap with the Writing Stage.

1.3.3 The Revision Stage

Twelve percent of the children who entered the Revision Stage of Writing Process as well as others who revised the writing, while they were still at the Writing Stage tended to make mechanical changes and surface level changes. There was no metacognitive awareness of deep level revising.

It was observed that the fields of self evaluation and organization were mixing with the Revision Stage, when the interview data were analysed according to five metacognitive fields,.

As a whole the self regulation field could not be found in the writing behaviour of secondary school children.

1.4 Metacognitive emphasis on each stage of the Writing Process: Quantitative analysis of interview data

The fact that the Writing Stage dominated the Writing Process could also be identified from the quantified interview data. 2481 steps of 289 interviews were read, coded and analyzed quantitatively to identify the distribution of student ideas in the three stages of the Writing Process, the five fields of metacognition and the 72 metacognitive strategies.

Of the total number of times mentioned (3715), Writing Stage was mentioned in 49%, as against 31% on the Planning Stage and 20% on the Revising Stage. The emphasis on Writing Stage as against the other two stages and on Planning Stage against Revision Stage was significant at 0.5 (Table 4). Hence, the dominance of the Writing Stage could be discerned in the Writing Process.

Table 4: Distribution and significance of expressed ideas of students according to stages of writing

Stages of writing	Number of times mentioned	%
Planning	1153	31%
Writing	1814	49%
Revising	748	20%
Total	3715	100%

Comparison of variables (proportionate Z test)	Stages of writing		
	Planning < > Writing	Planning < > Revising	Writing < > Revising
P value	1.0000	0.0000	0.0000
	Sig <	Sig >	Sig >

When the data were analyzed according to variables of sex, environment of the school (Rural/Urban) and grade (6, 7, 8, 9, 10), emphasis on the Writing Stage could be identified (Tables 5, 6 & 7). However, girls emphasize the Planning Stage whereas boys emphasize the Writing Stage and urban students emphasize

the Planning Stage and rural students emphasize the Writing Stage. Grade 6 students emphasize Planning and Writing Stages significantly and Grade 8 and 9 students emphasize Writing Stage as against Planning significantly. Further, Grade 8 students emphasize Planning than Revision.

Table 5: Distribution and significance of expressed ideas of students according to stages of writing and sex of the student

Stages of writing	Boys	%	Girls	%
Planning	452	28%	701	33%
Writing	831	51%	983	47%
Revising	335	21%	413	20%
Total	1618	100%	2097	100%

Comparison of variables		Stages of writing		
		Planning	Writing	Revising
P value	Boys < > Girls	0.9999	0.0033	0.2239
		<i>Sig <</i>	<i>Sig ></i>	<i>Not Sig</i>

Table 6: Distribution and significance of expressed ideas of students according to stages of writing and environment of the school

Stages of writing	Rural	%	Urban	%	Total	%
Planning	568	28%	585	35%	1153	100%
Writing	1034	51%	780	46%	1814	100%
Revising	427	21%	321	19%	748	100%
Total	2029	100%	1686	100%	3715	100%

Comparison of variable		Stages of writing		
		Planning	Writing	Revising
P value	Boys < > Girls	1.0000	0.0021	0.0638
		<i>Sig <</i>	<i>Sig ></i>	<i>Not Sig</i>

Table 7: Ideas expressed by students according to stages of writing and grades

Grade	6		7		8		9		10	
	Total	%	Total	%	Total	%	Total	%	Total	%
Planning	178	29	246	31	158	26	258	28	313	40
Writing	285	46	372	47	337	55	478	53	342	44
Revising	155	25	169	22	120	19	176	19	128	16
Total	618	100	787	100	615	100	912	100	783	100

Comparison of variable (Grades)	Planning	Writing	Revising
	P-Value	P-Value	P-Value
6 < 7	0.26046	0.3909	0.84829
	<i>Not Sig</i>	<i>Not Sig</i>	<i>Not Sig</i>
6 < 8	0.79356	0.02098	0.94274
	<i>Not Sig</i>	Sig>	<i>Not Sig</i>
6 < 9	0.52149	0.27535	0.75452
	<i>Not Sig</i>	<i>Not Sig</i>	<i>Not Sig</i>
6 < 10	0.04322	0.64238	0.95568
	Sig>	<i>Not Sig</i>	Sig<
7 < 8	0.91239	0.04902	0.70296
	<i>Not Sig</i>	Sig>	<i>Not Sig</i>
7 < 9	0.62085	0.31484	0.60147
	<i>Not Sig</i>	<i>Not Sig</i>	<i>Not Sig</i>
7 < 10	0.09662	0.69942	0.83625
	<i>Not Sig</i>	<i>Not Sig</i>	<i>Not Sig</i>
8 < 9	0.39372	0.58808	0.51008
	<i>Not Sig</i>	<i>Not Sig</i>	<i>Not Sig</i>
8 < 10	0.01632	0.94557	0.72663
	Sig>	<i>Not Sig</i>	<i>Not Sig</i>
9 < 10	0.14394	0.76884	0.62511
	<i>Not Sig</i>	<i>Not Sig</i>	<i>Not Sig</i>

When the data were compared among grades (6, 7, 8, 9, 10) Grade 6 children significantly emphasized more on Revision than Grade 10 children and

Grade 10 children significantly emphasized more on Planning than Grade 6 children (Table 8).

Table 8: Expressed ideas of students according to fields of metacognition

Metacognitive fields	No. of times expressed	%
Generating ideas	1386	26%
Goal setting	441	8%
Organizing	1183	22%
Monitoring	1301	24%
Evaluating	1058	20%
Total	5369	100%

Comparison of variables	p - value
1 Generating ideas \diamond 2 Goal setting	1.0000 <i>Sig <</i>
1 Generating ideas \diamond 3 Organizing	0.8349 <i>Not Sig</i>
1 Generating ideas \diamond 4 Monitoring	0.6292 <i>Not Sig</i>
1 Generating ideas \diamond 5 Evaluating	0.8214 <i>Not Sig</i>
2 Goal setting \diamond 3 Organizing	0.0000 <i>Sig ></i>
2 Goal setting \diamond 4 Monitoring	0.0002 <i>Sig ></i>
2 Goal setting \diamond 5 Evaluating	0.0364 <i>Sig ></i>
3 Organizing \diamond 4 Monitoring	0.3314 <i>Not Sig</i>
3 Organizing \diamond 5 Evaluating	0.6338 <i>Not sig</i>
4 Organizing \diamond 5 Evaluating	0.7303 <i>Not Sig</i>

1.5 Emphasis on each Metacognitive Field: Quantified interview data

Out of the Metacognitive Fields, Generating Ideas, Organization, Monitoring and Evaluation were mentioned 26%, 22%, 24%, and 20% respectively of the total terms (5369) as against 8% on Goal Setting. The less emphasis on Goal Setting is significant (Table 8). Significantly less emphasis on Goal Setting was established when data was analyzed according to variables of sex and environment of the school. According to grades, however, there was no significant difference between metacognitive fields. Girls set goals before writing than boys and boys tended to organize writing during the Writing Stage.

The Writing Style of telling ideas during the Writing Stage, gained from the teacher during the period of explaining the lesson could be visible. Since the Goal Setting was not prominent, children use knowledge telling strategies rather than knowledge transforming strategies in their writing.

1.6 Emphasis on each Metacognitive Strategy: Quantitative analysis of interview data

Out of the 72 metacognitive strategies in writing

considered in the study, 40 were related to Planning Stage, 19 were related to the Writing Stage and 13 to Revision Stage. The metacognitive strategies related to Writing Stage were cited as being used in 48% of instances, Planning Stage in 30% instances and Revision Stage only in 22% instances. The data indicate the emphasis on the Writing Stage than the other two stages. When the 72 metacognitive strategies were ranked according to the emphasis in interviews (Table 9), ranking first was the 'regulating thinking on the Writing Process while writing'. The reason for this may be that the writing behaviour of Planning and Revision falls within the Writing Stage itself. The least emphasized metacognitive strategy was 'summarizing and paraphrasing' indicating the minor emphasis on Revision within the Writing Process. The most emphasized strategy was 'regulating thinking on the Writing Process' and the least emphasized strategy was 'summarizing and paraphrasing'. Tendency of children to focus more on the Writing Stage and less on Revision is amply demonstrated by these relative emphases too.

Seventy-two metacognitive strategies were classified into nine categories, based on their ranks and the most emphasized metacognitive strategies and least emphasized metacognitive strategies were identified.

Out of the most emphasized metacognitive strategies five were related to Planning Stage and three were related to Writing Stage. None of the strategies were related to Revision. Strategies related to Planning were linked with the mental processes of children that help them to gain information from the lesson taught by the teacher using

their memory and readiness of the child for learning. The metacognitive strategy, 'checking the effectiveness of the approached solution' ranked ninth was the first metacognitive strategy related to Revision that was found in the list and until 27th rank, no other strategy related to Revision would be found in the ranking list showing less emphasis on Revision strategies.

Table 9: Ranks of specific metocognitive strategies according to the ideas of students

No. of the strategy	No. of times expressed	Rank	Stage of writing	Strategy
45	688	1	Writing	Thinking of the writing process
48	584	2	Writing	Showing awareness on present cognitive and emotional status when using cognitive processes related to writing
5	521	3	Planning	Being aware of the task assigned
18	480	4	Planning	Memorizing
1	470	5	Planning	Self evaluation
2	436	6	Planning	Understanding the necessity of writing
22	426	7	Planning	Seeking information
51	426	8	Writing	Self monitoring of progress
62	426	9	<u>Revising</u>	Checking the effectiveness of the approached solution
46	342	10	Writing	Using writing effectively
50	337	11	Writing	Using a monitoring plan to assess the effectiveness of writing task
56	334	12	Writing	Checking again while engaged in the writing
49	295	13	Writing	Reflecting on the writing task
19	259	14	Planning	Adjusting facts mentally
53	248	15	Writing	Making changes for a better document while engaged in writing
3	247	16	Planning	Evaluating the necessity for writing
37	241	17	Planning	Identifying solution strategies as hints
4	232	18	Planning	Knowledge on the specific writing task, its difficulties and skills needed for it
52	229	19	Writing	Depend on surface level characteristics
15	203	20	Planning	Knowing when, where, how, and what is to be written
27	198	21	Planning	Selection of suitable information
47	198	22	Writing	Using the writing format effectively
6	197	23	Planning	Predicting problems
14	189	24	Planning	Changing strategies according to task
44	187	25	Writing	Using facts and instructions learned previously
41	184	26	Writing	Transformation of writing
61	182	27	<u>Revising</u>	Awareness on the necessity on revision
20	178	28	Planning	Using prior knowledge
57	178	29	Writing	Sensitivity to external communicators and environment
63	177	30	<u>Revising</u>	Making mechanical changes to produce better document
35	164	31	Planning	Considering alternative strategies
21	160	32	Planning	Using brainstorming, reading, interviewing, observing to acquire information

No. of the strategy	No. of times expressed	Rank	Stage of writing	Strategy
43	155	33	Writing	Awareness on the facts and grammar needed for writing
8	152	34	Planning	Identifying the goal Identifying the necessity for developing a specific plan
11	140	35	Planning	When encountered a task to be implemented without other's help
25	140	36	Planning	Depicting thinking via physical acts
10	139	37	Planning	Metacognitive task of predicting on the effectiveness of writing
64	135	38	<u>Revising</u>	Making surface level changes to produce better document
9	126	39	Planning	Setting manageable goals
72	126	40	<u>Revising</u>	Identifying qualities and weaknesses of own writing due to the intervention of an external person
23	125	41	Planning	Seeking help from peers/teachers/ adults
67	115	42	<u>Revising</u>	Evaluating the quality of writing
13	104	43	Planning	Changing strategies according to writing task assigned
55	103	44	Writing	Considering contingency plans when facing a problem
59	93	45	Writing	Forward planning while doing the task
54	92	46	Writing	Organization of facts
33	87	47	Planning	Using necessary information to solve problems
36	85	48	Planning	Choosing a strategy among many
39	85	49	Planning	Rehearsal
7	81	50	Planning	Thinking of the audience
38	74	51	Planning	Systematic planning
66	71	52	<u>Revising</u>	Reviewing notes
42	66	53	Writing	Regulating pre-planning to suit the finishing of the writing task
30	63	54	Planning	Separation of basic facts
65	59	55	<u>Revising</u>	Deep level revising to produce a better writing
12	51	56	Planning	Preparation of drafts
40	45	57	Planning	Adjusting environment
69	45	58	<u>Revising</u>	Taking action to collect extra information
70	43	59	<u>Revising</u>	Recasting the expected meaning
34	40	60	Planning	Identifying alternative concepts
26	39	61	Planning	Keeping records / notes
29	34	62	Planning	Dividing into parts
68	33	63	<u>Revising</u>	Predicting new incidents
32	32	64	Planning	Categorization of basic facts
24	30	65	Planning	Regulating thinking using more than two media
58	28	66	Writing	Adjusting beginning, middle and end of the writing while writing
71	28	67	<u>Revising</u>	Looking at own writing as a reader
17	22	68	Planning	Self instructional
16	18	69	Planning	Mnemonic encoding
28	18	70	Planning	Writing again as facts
60	17	71	<u>Revising</u>	Summarizing/ paraphrasing
31	16	72	Planning	Summarizing basis facts

The emphasis placed on product of Writing has to be changed to an emphasis on process of writing at the classroom level teaching learning process. The Planning Stage was dominated by teacher explanations and providing facts about the lesson. This period can be used to enlighten the Metacognitive strategies of children. However children do memorize as a strategy during the lesson explaining stage. Memorization is the fourth in rank out of the 72 metacognitive strategies (Table 9).

2. Patterns Emerging from the Sample of 725 Students

The responses for the 113 items developed to represent metacognitive strategies in the Writing process in the structured questionnaire were analyzed in three stages to see whether the findings of the sub sample could be generalized to the selected classrooms with 725 children.

2.1 Hierarchical Tree Cluster Analysis

The speculative patterns that emerged from Hierarchical Tree Cluster analysis showed a similarity in metacognitive strategies used by boys and girls in rural and urban schools. There emerged a distant relationship in metacognitive use between Grade 6 children and children in Grades 7, 8, 9 & 10 (Fig. 13, 14, & 15).

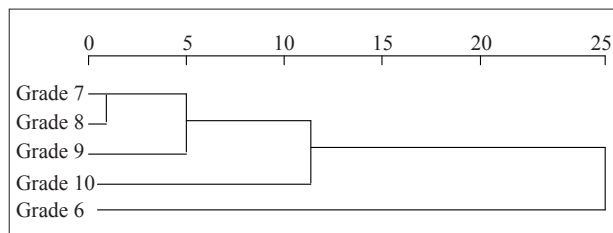


Figure 13: Clustering of responses of students according to grade

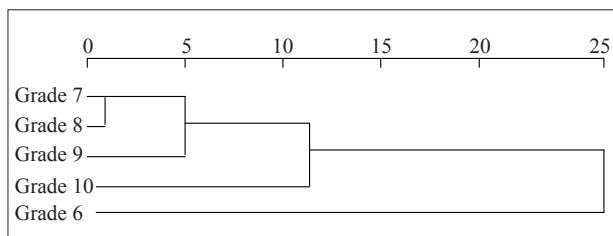


Figure 14: Clustering of responses of boys according to grade

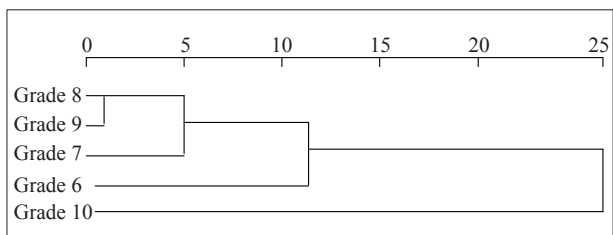


Figure 15: Clustering of responses of girls according to grade

2.2 Chi Square Test

Chi square test on 113 items that represented metacognitive strategies in writing of the questionnaire confirmed the distanced pattern between the Planning / Revision Stages and the Writing Stage. Also the test confirmed the mixture of Planning and Revision behaviour with the Writing Stage i.e. children’s behaviour of Planning and Revising while they were writing.

Seventy three percent of the items of the questionnaire did not significantly relate to the variable of school and 70% of the items of the questionnaire did not significantly relate to the school grades. However, only 46% of the items of the questionnaire did not significantly relate to the variable of sex. Hence it seems that although there is no division between schools and grades, there is a tendency towards girl - boy dichotomy.

The 30 items out of 113 of the questionnaire that were not significantly related to school, grade and sex of the child were categorized into three stages of Writing Process (Table 10) to identify common metacognitive strategies for all children in the sample and their distribution in the stages of the writing process. Accordingly seven items related to Planning indicates the ‘engagement in mental pre-writing’ with less cognitive effort. Also the ‘using of drafts to organize ideas effectively’ and other complex Planning strategies are weak in the writing behaviour of the children. As a result when writing, children ‘first write one sentence and then think about one by one about the other sentences’ rather than using prior planning during the Planning Stage to write effectively during the Writing Stage.

Twelve items related to Writing Stage showed the difficulties children were facing due to lack of planning and external factors that influenced the writing task. ‘The difficulty in writing the first sentence’, ‘forgetting of words while writing’ were the difficulties faced due to poor pre- planning. ‘Hindrances or disturbances of friends’, ‘looking at writing of others’ were the external factors that influenced writing. However children could ‘add extra facts to the appropriate places while they were writing’ and ‘concentrate on letters omitted’. Hence they are in a position to regulate their writing at the Writing Stage.

Seven items related to Revision indicate the awareness about the revision behavior during the Writing Stage. The revision made during the Writing Stage, however, was limited to mechanical and surface level changes. They were not aware about the deep level revising. They were also not aware of the need for revision after the Writing Stage as they were ‘content with the written work’ and their speculation on their own writing was ‘a success’.

Table 10: Distribution of items in the questionnaire which are not significantly related to school, grade and sex according to stages of writing

No. of item	Strategy	Stage of writing	Strategy or metacognitive strand
21	I feel it is difficult to write the first sentence	Writing	Awareness
23	Even after writing the first sentence, I have to remind the other sentences one by one	Writing	Strategy
27	Sometimes I find it difficult to understand what to write	Planning	Awareness
30	Sometimes I feel that I do not understand how to write	Planning	Awareness
32	I know the reasons for not understanding how to write an assigned writing task	Planning	Awareness
42	It is my habit to imagine and write the whole sentence	Planning	Strategy
21	I feel it is difficult to write the first sentence	Writing	Awareness
23	Even after writing the first sentence, I have to remind the other sentences one by one	Writing	Strategies
36	I forgot what to write, when my friends trouble me after starting the writing task	Writing	Regulation
39	If someone is observing while I am writing, I can not do it well and I make many mistakes	Writing	Regulation
43	The facts that come to my mind after writing something are added to necessary places later	Writing/Revising	Strategies
45	I forget the words while I am writing	Writing	Awareness
48	I am unable to write the difficult words found in the copy writing looking only once at them	Writing	Regulation
49	As I forget some letters in words I have to write them with much concern	Writing	Regulation
50	I do not know why I write some words incorrectly	Writing	Awareness
82	When writing essays, it is my habit to think about all the facts at first and then to continue writing	Planning (Essay)	Strategies
91	I need to complete writing an essay assigned to me as soon as possible	Writing (Essay)	Strategies
93	It is somewhat difficult for me to decide what to include in an essay. But it is easy for me to answer the questions in the text book.	Planning (Essay)	Regulation
98	When writing an essay, first I imagine it; then start writing	Planning (Essay)	Strategies
99	I relate my experiences to the essay	Writing (Essay)	Strategies
103	I make corrections in essays, if the teacher asks only	Revising (Essay)	Regulation
60	It is my habit to highlight unclear letters by writing again on them	Revising	Strategies
68	I handover my writing to the teacher if I feel I have written them well	Writing	Awareness
80	I can speculate how successful my piece of writing is	Writing	Awareness
70	I hand over product of writing to the teacher whether it was written in a good way or not because I can finish the writing within the period	Controlling writing due to external factors: Revising	Regulation
75	I hand over product of writing to the teacher whether it was written in a good way or not because I can't show the writing next day to the teacher to be corrected	Controlling writing due to external factors: Revising	Regulation
77	I hand over product of writing to the teacher whether it was written in a good way or not because I am praised by the teacher when I finish the writing task earlier	Controlling writing due to external factors: Revising	Regulation
78	I hand over product of writing to the teacher whether it was written in a good way or not because Due to competition with other children I want to show the teacher first	Controlling writing due to external factors: Revising	Regulation

2.3 Factor Analysis

The specific patterns identified through factor analysis confirm the patterns that emerged so far. The 31 items of the questionnaire that were significantly related to school, 34 items significantly related to grade and 61 items significantly related to sex of the child were categorized into 11, 11, and 4 factors respectively and they were compared with the three stages of Writing Process, metacognitive strands and specific metacognitive strategies (Table 11, 12 & 13).

Table 11: Factors according to school

Factor 1 Without the stage of Revising. Negative awareness on the writing strategies (Related items of questionnaire 14, 24, 57, 58, 72, 89)
Factor 2 Can not identify the Planning Stage specifically. Planning characteristics can be seen within the Writing strategies (Related items of questionnaire 3, 4, 5, 6, 83)
Factor 3 There is awareness and strategies on Planning. Regulate such strategies during the Writing Stage (Related items of questionnaire 97, 100, 105)
Factor 4 Awareness on writing mixed with visible Planning strategies (Related items of questionnaire 8, 9, 107)
Factor 5 Control writing by environmental factors (Related items of questionnaire 26, 37)
Factor 6 Ability and non ability to regulate Writing according to awareness and strategies about Planning (Related items of questionnaire 11, 12, 86)
Factor 7 Sculptural Writing and Revising. No Planning (Related items of questionnaire 1, 111)
Factor 8 Can evaluate the Writing if there is awareness and strategies about mental Planning (Related items of questionnaire 7, 13, 79)
Factor 9 Using awareness on Planning to revise Writing (Related items of questionnaire 10, 61)
Factor 10 Regulation of Writing (Related items of questionnaire 64, 71)
Factor 11 Effective Writing without Planning (Related items of questionnaire 20)

Out of the 11 factors related to school, the first, second and third factors do not include metacognitive strategies related to Planning and Revision. Although awareness and strategies were included in the third factor, visible

Planning was shown only in the fourth factor. Regulation of Planning was not included in any of the factors and Revision was shown only in the seventh factor. Hence according to the factor analysis on school, a Writing Style dominated by Writing and less emphasized by Planning and Revision could be identified. Although children have specific writing strategies, their awareness and regulation of such strategies have less importance (Table 11).

Grade wise analysis also shows less importance being given to the Planning Stage and more importance given to the Writing and Revising Stages in the first four factors. In the 5th factor, Planning is seen but with a mixture of Writing and Revising, emphasizing its lower independence. Although Writing and Revising is visible in the first factor, awareness and regulation of strategies are prominent, and they are controlled by external factors and internal factors of the student.

Table 12: Factors according to Grades

Factor 1 No Planning. Awareness, strategies and regulating on Writing and Revision controlled by external factors and internal factors of the child (Related items of questionnaire. 34, 56, 108, 113)
Factor 2 Regulation of awareness and strategies on Writing. No regulation of Revision (Related items of questionnaire 24, 57, 11, 74, 41, 95)
Factor 3 Strong awareness on Writing (Related items of questionnaire 73, 51, 88)
Factor 4 Writing without Planning. Sculptural Writing. However, no Revision (Related items of questionnaire 5, 6)
Factor 5 Awareness, strategies and regulation on Planning and Revision (Related items of questionnaire 85, 59, 65, 106)
Factor 6 Use Revising to avoid weaknesses in regulation of Writing Strategies (Related items of questionnaire 53, 19, 62)
Factor 7 Regulation of strategies mixed with Planning and Writing (Related items of questionnaire 29, 44, 97)
Factor 8 Awareness on Writing (Related items of questionnaire 55, 79)
Factor 9 Awareness on Knowledge Telling Writing strategies without Planning (Related items of questionnaire 104, 101)
Factor 10 Revising based on awareness on Writing (Related items of questionnaire 66, 15)
Factor 11 Regulating Writing strategies, sensitizing Revision and controlling effects of external environment (Related items of questionnaire 90, 38, 76)

Sculptural Writing Style could be identified due to the Planning free writing (Table 12).

Even the sex wise analysis shows less importance being given to Planning (Table 13).

Table 13: Factors according to sex of students

Factor 1 Writing without Planning. Awareness on the difficulty of Writing. Writing behaviour according to external variables. No goal setting and self regulation. (Related items of questionnaire 14, 24, 57, 58, 72, 89)
Factor 2 No Planning. Writing according to teacher instructions and texts and experiences (Related items of questionnaire 101, 11)
Factor 3 No regulating of time. There is self awareness (Related items of questionnaire 92, 90)
Factor 4 Writing according to teacher instructions and memory (Related item of questionnaire 12)

CONCLUSIONS

The Planning Stage of children is dominated by explanation of the lesson by the teacher, which gives children ideas that can be used in the Writing Stage. The metacognitive strategies used in the Planning Stage are 'awareness about the assigned writing task', 'memorizing', 'self-evaluation', 'understanding the necessity for writing', 'seeking information', 'adjusting facts in mind', and 'evaluating the need for writing'. The lesser used strategies in the Planning stage are 'summarizing basic facts', 'rewriting as facts', 'mnemonic', 'self instructional coding', 'thinking using more than two media', 'classification of basic facts', 'breaking into parts', 'keeping reports / notes', 'identification of alternative concepts', and 'adjusting the environment'. Metacognitive field of 'Goal setting' is not used for Planning. Students do not show an awareness or regulation of metacognitive strategies in metacognitive strands on Planning.

The metacognitive strategies used in the Writing Stage are 'self-regulation of Writing', 'activating cognitive processes about Writing', 'showing awareness on present cognitive and emotional status in the Writing Process' and 'self-monitoring of progress'. Least used metacognitive strategy is 'adjusting the beginning, middle and end aspects of the Writing activity while facing external

influences'.

A mechanical and surface level Revising Style can be identified among students. Deep level changes are not found. The only metacognitive strategy used in Revising Stage is 'checking the product of Writing'. Least used metacognitive strategies for Revising are 'summarizing/ paraphrasing', 'seeing his/ her own written work as a reader', 'predicting new incidents', 'recreating expected meaning' and 'taking necessary steps to add extra information'.

'Knowledge Telling Process' rather than 'Knowledge Transformation Process' can be found in the Writing Process of secondary school children proving the theory of writing suggested by Scardamalia and Bereiter.

Metacognitive strategies used by students, their awareness of those and the way they regulated metacognitive strategies do not differ according to rural schools and urban schools. Writing characteristics of Grade 6 children are distanced from Grade 7, 8, 9, and 10. There is no significant difference between girls and boys on ideas of Revising Stage. However there is a tendency towards a boy - girl dichotomy with regard to using metacognitive strategies in the Writing Process. Girls emphasize the Planning Stage than boys and boys emphasize the Writing Stage than girls.

A hunch, which needs further research to be confirmed, can be found about the sculpture style of writing of grade 6 children as against the Engineering style of writing of grade 10 children.

SUGGESTIONS

Due to the lack of emphasis on Planning and Revising in the Writing Process at classroom level, it is necessary to enhance the quality of written work / writing assignments of students. Therefore:

- There is a need for training on metacognitive strategies for students;
- Methods of training on metacognitive strategies should be included in teacher training courses;
- Methods of training on metacognitive strategies should be included in teacher guides and textbooks.
- The emphasis placed on product of Writing has to be changed to an emphasis on the process of writing at the classroom level teaching-learning process.

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