SUMMARY

Dysgraphia is not an indication of low intelligence. Many famous people like General George S. Patton, Albert Einstein, Louis Pasteur, Agatha Christie have struggled with the disability.

INTRODUCTION

Learning of academics is the core component of any school curriculum. For success in academic endeavors one has to acquire the basic components i.e. reading, writing, speaking, listening and spelling and in the formative stage the child acquires these components of learning. In the process of learning some students learn easily these components without confronting any difficulties whereas for some students it is a challenging and arduous task to have a mastery over these components of learning that leads to academic fiasco and maladjustment in school and home environment. When a child doesn't seem to be learning, some teachers expel the child from classroom and parents criticize the child and think both of him/her as stupid, or may be just too sluggish to want to learn.

Sometimes there are apparently inexplicable blocks to learning which prevent intelligent children from reaching their potential in the classroom. There are up to 20 per cent of children not achieving the academic results that their intelligence indicates they should be capable of achieving. The blockages can be so difficult to ascertain that no one is aware of the real problem. Consequently, the frustrated and withdrawn behaviour which results is often blamed as the cause of the problem. Many times, the finger is pointed directly at poor parenting or poor teaching. What they don’t realize is that the child might have a learning disability.
In India, approximately 13 to 15 per cent of school age populations suffer from some form of learning disorders. Learning disabilities can affect a person’s ability in the areas of listening, speaking, reading, writing and mathematics and is often first suspected when there is a clear and unexplained gap between an individual’s level of expected and actual levels of achievement. Learning disabilities also can encompass problems in the area of social-emotional skills and behaviour, and some individuals with learning disabilities struggle with peer relationships and social interactions in addition to academic challenges. As a result, these children are branded as failures. With proper diagnosis, appropriate education, hard work and support from family, friends, teachers and others, a learning disabled can lead a successful and productive life. There are many programs, special schools and facilities, home teaching methods and many other ways in which children with Learning Disabilities can be helped.

Various plans and policies have been enacted to help learning disabled children in academic and personal life at International and National levels i.e., Universal Declaration of Human Rights, 1948 proclaimed the right of every child to education and is forcefully reaffirmed by the World Declaration on Education for All(1990). The Salamanca statement (1994) again proclaims that every child has a fundamental right to education and must be given opportunity to achieve and maintain an acceptable level of learning. This act further affirmed that children with special education needs must have access to regular schools, which should accommodate them within child centered pedagogy capable of meeting these needs. However the 86th Amendment, 2002 and article 21(A) of the Indian Constitution envisages that every child of the age six to fourteen years shall have a right to free and compulsory education in a neighborhood school till completion of elementary education. Provided that a child
suffering from disability either physical or sensory, as defined in clause(i) of section 2 of the Persons with Disabilities (Equal Opportunities, Protection of Rights and Full Participation) Act; 1995 shall have the right to pursue free and compulsory elementary education in appropriate environment till eighteen years of age. Unfortunately, most schools fail to lend a sympathetic ear to their problems.

The nation's commitment towards achieving the goal of 'Universalisation of Elementary Education' remains unfulfilled and will remain elusive if educational opportunities are not extended to all school-going children including children with Learning Disabilities. Government of India envisages many policies and programmes at national level and state level through debates and deliberations for accommodating and rehabilitating learning disabled children in the classroom.

RATIONALE OF THE STUDY

Literacy is not a natural outgrowth from orality (Horwitz & Samuels, 1987; Kress, 1994; Olson & Torrance, 1981; Wood, 1998). Becoming literate in our society entails that children learn to exercise and control over the written discourse. Writing is a core element in the educational process right from grass root level and is acknowledged by most people to be fundamental for school success. Being an integral part of the school curriculum, it is also considered to be the key to innovation and change in the future (Kress, 1995). It seems that children’s first urge may be to write rather than to read (Clay, 1983) and consequently, writing comes more naturally than reading (Stallard, 1974). Writing serves as an instructional tool as well as vehicle of self expression at the elementary level.
Learning to write is a complex and multifaceted process. Children learn and integrate a range of skills and gain an understanding of written conventions before they themselves can communicate in writing. Children think in abstract and communicate with a remote audience in written form with whom they do not directly interact or receive feedback. Written language, or the ability to express thoughts, and ideas in writing, is the identity of a literate person. Writing is used for effective communication in business and professions through letters, reports and books. Creative works of literature stimulate and enrich the cognitive process of human beings. But everyone in our society must have the rudiments of written language for activities of daily living. Just as reading is essential for minimal success, so is writing.

Writing represents a highly complex neuro-developmental process which requires multiple brain mechanisms and it involves gross and fine motor coordination, motor memory, and kinesthetic memory, simultaneous and sequential integration of attention, language, and higher cognition. The primary requirements for written language include an intact central nervous system, intact cognitive ability, intact language skills (both receptive and expressive), motivation, skill development, practice, and emotional stability. Secondary requirements for written language include concepts of organization and flow, writing skill, spelling skill, syntax and grammar knowledge, mechanics, productivity, accuracy, visual and spatial organization, simultaneous processing, revisualization, and automatization. It is also a complex cognitive and motor skill activity involving attention at multiple levels: thematic, paragraph, sentence, grammatical and lexical (Biggs, 1988). Written language is considered to be one of the highest forms of language. In the hierarchy of language abilities, it is the last to be learnt. Abilities and experiences in listening, speaking, and reading usually precede the
development of writing skills. Successful performance in written language depends on the prior acquisition of skills in oral language and reading and on the integration of skills in handwriting, spelling, punctuation, and capitalization.

Difficulties in any of these other language areas will certainly interfere with the acquisition of the written form of language (Johnson & Myklebust, 1967). Children with writing difficulties experience difficulties with fine motor control and hand eye coordination leading to problems with handwriting (Berninger et al. 1991). They may have problems with phonological coding and limited knowledge of grapheme phoneme correspondences leading to difficulties with spelling (Snowling, 1994). Children with various writing problems invariably experience spelling disabilities. Alternatively, they may have difficulties with the compositional aspects of writing such as the generation of ideas or the ability to structure text, or they may lack meta cognitive knowledge of the processes involved in writing (Englert and Raphael, 1988). Hagtvet (1993) noted that pupils experiencing writing difficulties were more likely to have uneven developmental profiles and display a range of difficulties. Overall, they produce less writing, with more inaccuracies, poor organization and weaker content (Tindal and Parker, 1991; Graham and Harris, 1996). A number of other factors are also related to written language disorders that include spoken language disturbances, auditory blending problems, visual discrimination difficulties, word analysis deficits, speech articulation problems, and various instructional factors.

Learning disabled students have been characterized as having severe and persistent writing problems (Graham & Mac Arthur, 1987). Graham and Harris (1989) noted that these students have considerable difficulty in executing and monitoring many of the basic cognitive processes central to effective writing. In terms of generating
content, students with LD produce written texts that are inordinately short (Deno, Marston and Mirkin, 1982; Nodine, Barenbaum, and New Comer, 1985). Learning disabled students write stories and essays that are shorter than those of their normally achieving peers. Nodine et al. (1985) reported that learning disabled students’ stories were on the average 54 words in length, while normally achieving children wrote stories with approximately 104 words. Limited fluency may be related to lower overall quality and content. Mac Arthur & Graham (1986) found significant correlations between length and story structure and measure overall quality. An additional difficulty exhibited by most learning disabled students involves the mechanics of writing. On both standardized tests and informal measures of contextual writing, these students demonstrate considerable difficulty in spelling words correctly or using proper punctuation and capitalization (Moran, 1981). Learning disabled students, however, tend to make more grammatical errors than their normal peers (Moran, 1981). These students struggle to write and consequently spend much more time than their normal peers on a writing assignment. Even so, they remember less: so much of their energy is spent on the process that they often do not learn or sometimes even process the content of what they are working on. For these students, there is an underlying reason that their papers are messy or that their speed is excessively fast or excessively slow. They are labeled as poorly motivated, careless, lazy or impulsive.

Learners with mild learning disabilities may have difficulty with any or all of these problems. Research has demonstrated that these pupils often use fewer and complex words than others in written composition (Poteet, 1980) and are poorer at expressing abstract reasoning (Myklebust, 1973). Despite instruction, these pupils often seem to ignore the conventions, of grammar, punctuation, and capitalization and to violate the rules of sentence
structure; producing significantly more sentence fragments and/or run on sentences (Myklebust, 1973). Poor fine motor coordination likewise creates problems with handwriting for mildly handicapped learners.

Many students who struggle with writing also have difficulty with spellings. Spelling problems appear to be particularly pronounced among learning disabled students. Even if they are able to spell correctly on a spelling test, when they are thinking of content it may be very difficult to also think of the correct spelling of the words they want. Some students then simplify their word usage. Other students just include the incorrectly spelled word. A common complaint of students who struggle to write is that their hand gets tired when writing. This can be due to a variety of factors. Some of the most common factors are inappropriate grip, a very tight pencil grip, or inefficient writing posture. Some students may be able to copy and write single sentences with a fair degree of ease, but they struggle tremendously with paragraph writing. Some dysgraphic students have great difficulty with spelling especially if sequencing is a major issue for them. Additionally, many dysgraphic students experience Dyslexia, a sequential processing problem that affects reading and spelling. Creative compositions written by LD students frequently lack even the most basic story elements (Barenbaum, Newcomer & Nodine, 1987; Graham & Harris 1989; Nodine, Barenbaum, & Newcomer, 1985).

The writing problems of children with learning disabilities are commonly prevalent in every classroom and constitute approximately 15 per cent of the school population in India. If the problems of learning disabled children continue to persist and are not properly addressed at the appropriate stage, their achievement would lead to academic retardation and maladjustment, which in turn may result in constant fiasco in academic endeavor and
professional field in later life and resulting in stagnation and consequent high dropout rate. Thus, this leads to wastage of human resource and country’s national and economic development would go downwardly.

Hence, those pupils experiencing difficulties with learning to write respond to planned, targeted instruction, providing that intervention is early enough to avoid the impact of negative effects of failure (Tindal & Hasbrouck, 1991; Hagtvet, 1993). Research into writing is much more limited than reading (Cameron et al. 1996). In addition, most research has focused on theoretical aspects of Dysgraphia has neglected investigation of treatment options (e.g., Bub & kertesz, 1982; Ellis, 1988; Friedman & Alexander, 1990; Katz & Deser, 1991; Miceli & Silveri, 1985; Patterson, 1988; Rapcsak, 1997; Robinson & Weekes, 1995; Romani, Ward & Olson, 1999). And there is a lack of consensus about a model of writing development that can adequately guide teaching, assessment and curriculum planning (Applebee, 2000). Due to paucity of research in this area in India in particular and other countries in general, there is an urgent need of research in order to develop the writing skills of learning disabled children. It is in this background that the study has been planned.

STATEMENT OF THE PROBLEM

The problem investigated in the present study is stated as:

“Impact of an Intervention Programme on the Development of Writing Skills of Students with Dysgraphia”

OPERATIONAL DEFINITIONS OF THE KEY TERMS USED

INTERVENTION

Intervention consists of all planned attempts to promote the welfare of children with special needs. There are three broad types of interventions: preventive, remedial and compensatory. In the present
study intervention is remedial in nature with special reference to writing skills development of students with dysgraphia. For the present study the various types of intervention programme viz. alphabet warm up, alphabet practice, alphabet rocket, multisensory strategies, multiple strategies, whole word approach, linguistic strategy, Self Regulated Strategy Development (developing background knowledge, discussing, modeling, memorizing, supporting and independent performance) have been used for the development of writing skills of students.

**WRITING SKILLS**

For the present study, writing skills of students with dysgraphia comprise handwriting, spelling, written expression and notes taking. Handwriting is the graphomotor skill by which children express their ideas in written form. It combines visual perceptual, visual memory and the motor coordination necessary for executing the act. It includes various components of handwriting of writing skills viz. alignment, letter spacing, word spacing, letter size, slant and line quality. In the present study handwriting component of writing skills means scores obtained by students with dysgraphia on handwriting component of writing skills test. Spelling skill means ability to produce writing materials without committing error and word analysis skill. It includes the components of spelling of writing skills viz. number of correct and incorrect spellings. In the present study the spelling component of writing skills means the scores obtained by students with dysgraphia on spelling test. Written expression is the ability to express an opinion or argument in written form. It includes the various components of written expression of writing skills viz. organization, cohesion, originality, mechanic, language, narrative text structure and expository text structure. In the present study the written expression components of writing skills means the scores obtained by students with dysgraphia on written
expression test. Notes taking is the ability to take notes when a
teacher is dictating. It includes the various components viz. incorrect
letters, incorrect words, missing words and correct sentences. In the
present study the notes taking component of writing skills means
the scores obtained by students with dysgraphia on notes taking
test.

STUDENTS WITH DYSGRAPHIA

Dysgraphia is a problem with writing process. Dysgraphia is
the impaired ability to express ideas in writing (Gaddes, 1980). Children who have acquired a limited vocabulary, have poor reading
skills, and have difficulty using grammar and syntax usually are
unable to organize and translate their thoughts in to writing. Written
sentences tend to be short and concrete. Words frequently omitted or
poorly organized into sentences; verbs and pronouns are misused;
and errors in grammar, capitalization; and punctuation are
displayed (Johnson and Myklebust, 1967). For the present study
students with dysgraphia means learning disabled students having
problems in handwriting, spelling, written expression and notes
taking.

OBJECTIVES OF THE STUDY

1. To identify writing skills deficits (Dysgraphia) in children with
   learning disabilities.
2. To find out the prevalence rate of writing skills deficits
   (Dysgraphia) in children with learning disabilities.
3. To design an intervention programme for the development of
   writing skills of students with dysgraphia.
4. To implement the intervention programme for the development
   of writing skills of students with dysgraphia.
5. To evaluate the efficacy of the intervention programme in the
   development of writing skills of students with dysgraphia.
HYPOTHESES OF THE STUDY

1. The intervention programme will have a significant positive effect on the development of handwriting skills of students with dysgraphia.

2. The intervention programme will have a significant positive effect on the development of spellings of students with dysgraphia.

3. The intervention programme will have a significant positive effect on the development of written expression of students with dysgraphia.

4. The intervention programme will have a significant positive effect on the development of notes taking skills of students with dysgraphia.

DELIMITATIONS OF THE STUDY

The study was delimited to

1. Students studying in Public Schools of Gurgaon district of Haryana.

2. 30 students with dysgraphia only.

3. Students in grade seven only.

RESEARCH METHODOLOGY

Methodology primarily helps us to understand and evaluate the merits of all the information we usually confront with any sort of research activities. A research methodology defines what the activity of research is, how to proceed, how to measure progress, and what constitutes success. The methodology adopted in the study answers these three main questions: How the sampling procedure is selected so that the sample can estimate the population (sampling)? How the data can be collected or generated (tool)? How it analyzed (statistical
technique)? Further, it is necessary to adopt a systematic procedure to collect the necessary data, which helps researcher to test the hypotheses of the study under investigation. Keeping in mind the nature and need of the present research, the experimental method was considered to be most appropriate one. Experimental method is the sophisticated and scientific research approach that can truly test hypotheses concerning cause-and-effect relationships. In an experimental study, the researcher deliberately manipulates at least one independent variable, controls over confounding variables through appropriate research design, and observes the effect on one or more dependent variables. In this method, the total sample is randomly divided into two equal sampling groups i.e., the experimental group and the control group or more than two on the basis of certain criteria. Only the experimental group is exposed to the manipulated variable. The researcher compares the pretest results with the post test results for both the groups. Any significant divergence between the two sampling groups is assumed to be a result of the experiment. In the present study, the researcher manipulated independent variable i.e., ‘set of intervention programme’ on dependent variable i.e., ‘developing writing skills of students with dysgraphia’ in a controlled classroom situation by controlling to a certain extent the confounding variables through the use of appropriate research design.

**POPULATION AND SAMPLE**

For the present study, all students having dysgraphia and studying in seventh grade with mean age of twelve in public schools of Haryana constituted population. The sample for the present study comprised all the students with dysgraphia of VII standard studying in three public schools of Gurgaon district of Haryana. For selecting
these sampled schools and students, the researcher first visited District Education Office, Gurgaon for getting permission to collect data from schools and procured list of schools. The sample of the study was drawn purposively from these schools through two stages. In the first stage schools were selected and in the second stage subjects were selected for the study.

HARYANA
DISTRICT (I) Gurgaon (30 Students)

School -I (10) School- II (10) School-III (10)
Experimental (5) Experimental (5) Experimental (5)
Control (5) Control (5) Control (5)
Students Students Students

DESIGN OF THE STUDY

The present study employed pretest-posttest control group experimental design involving groups of students with dysgraphia of Grade VII in the age group eleven to thirteen years drawn from public schools. The design for collecting data also envisaged three operational phases. The first phase involved screening of subjects through Intelligence test of Raven’s Standard Progressive Matrices (SPM); Teacher’s Observation Checklist; and a diagnostic test i.e., Test of Written Language (TOWL). Therefore, the first operational phase was termed as Pretesting and Identification stage. The second phase covered Treatment spread over for a period of six weeks. The experimental treatment comprised the use of a set of intervention strategies. The third phase included Posttesting in which after completion of the experimental treatment, Test of Written Language was administered.
Three Operational Phases for Pretesting, Treatment and Posttesting

<table>
<thead>
<tr>
<th>Phase</th>
<th>Description</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase One</td>
<td>Identification and one week Pre-testing</td>
<td>One Week</td>
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<tr>
<td></td>
<td>Administered</td>
<td></td>
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<tr>
<td></td>
<td>(d) Standard Progressive Matrices</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(e) Teacher’s Observation checklist</td>
<td></td>
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<tr>
<td></td>
<td>(f) Test of Written Language</td>
<td></td>
</tr>
<tr>
<td>Phase Two</td>
<td>Treatment</td>
<td>Six Weeks</td>
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<tr>
<td></td>
<td><strong>Experimental Group</strong></td>
<td></td>
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<tr>
<td></td>
<td>Teaching through</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(a) Self Regulated Strategy</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(b) Other Strategies for various components of writing</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Control Group</strong></td>
<td></td>
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<tr>
<td></td>
<td>Teaching through</td>
<td></td>
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<tr>
<td></td>
<td>Conventional approach</td>
<td></td>
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<tr>
<td>Phase Three</td>
<td>Post testing</td>
<td>One Week</td>
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<tr>
<td></td>
<td>Test of Written Language was administered</td>
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</tbody>
</table>
VARIABLES

**Independent Variable:** The intervention programme i.e., self regulated strategy, alphabet warm up, alphabet practice, alphabet rocket, multisensory strategies, multiple strategies, whole word approach, linguistic strategies for the development of various components of writing comprised the independent variable for the study.

**Dependent Variable:** Writing skills of students with dysgraphia in English language was the dependent variable which was measured in terms of scores obtained on various aspects of writing skills that is handwriting, spelling, written expression and notes taking.

**Variables Controlled:** Intervening variables like qualification and teaching experience of teachers, intelligence of children, and previous knowledge of students in English language, content taught and socio-economic status were controlled. Contamination between experimental and control group was controlled by choosing different schools for experimental and control groups.

**SELECTION OF SCHOOLS**

Keeping in view the target size of sample, the investigator visited and surveyed six public schools of Gurgaon city. No Government and semi Govt. schools were selected for the present study because the main purpose of a present study was to identify writing deficit of students in English language who have been studying in English medium school but in Govt. and semi Govt. schools the medium of instruction right from first standard is Hindi. The names of the schools are shown in table.
### LIST OF SCHOOLS SURVEYED

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Name of the Schools</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Aravali Public School, Delhi-Alwar Road, Sohna, Gurgaon</td>
<td>Selected</td>
</tr>
<tr>
<td>2</td>
<td>Shiv Public Senior Secondary School, Old Alwar Road, Sohna, Gurgaon</td>
<td>Selected</td>
</tr>
<tr>
<td>3</td>
<td>Jeevan Jyoti Public School, Sohna, Gurgaon</td>
<td>Selected</td>
</tr>
<tr>
<td>4</td>
<td>Salwan Public School, Site No- 2, Sector-15, Gurgaon</td>
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</tr>
<tr>
<td>5</td>
<td>St. P B N Public School, Sector 17, Gurgaon</td>
<td>__</td>
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<tr>
<td>6</td>
<td>South Town Public School-794, Sector 4, Urban Estate, Gurgaon</td>
<td>__</td>
</tr>
</tbody>
</table>

Out of the six schools surveyed, three schools were selected for the study and giving intervention programme as they were willing to cooperate and provide all sorts of facilities required for conducting the experiment. Therefore, a purposive sampling technique was employed to select these public schools for experiment because without cooperation of the schools the study could not have been conducted in the right perspective. Therefore, the schools selected for the experiment were three which are enlisted in Table.

### LIST OF SCHOOLS SELECTED FOR THE STUDY

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</tr>
</tbody>
</table>

221
**SELECTION OF SUBJECTS**

As has been indicated earlier, the students with dysgraphia in English language constituted the sample of the present study. In order to identify students with dysgraphia of Grade VII in public schools, three pronged identification strategy was used. In the first phase, intelligence test i.e., **Standard Progressive Matrices** was administered to 210 students from three schools in order to know the intelligence level of students as learning disabled students’ IQ level is average or above average. This lead to the identification of 170 students between the 25th-75th or above percentile on Standard Progressive Matrices by discarding the lower extreme group in the preliminary stage. In the second phase using **Teacher Observation Checklist** 140 students out of 170 were partially diagnosed as having dysgraphia. In the third and final phase a **Test of Written Language (ToWL)** was administered upon these 140 students in order to identify writing skill deficits students and finally 30 students were identified from lowest extreme group and selected for experiment by dividing in two parallel groups i.e., experimental and control group through random assignment.

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**Procedure to identify Students with Dysgraphia**

**First Phase**
- Intelligence test i.e. Raven's Standard Progressive Matrices was administered

**Second Phase**
- Teacher Observation Checklist was administered

**Third Phase**
- Test of Written Language (TOWL) was administered
FORMATION OF GROUPS

In experimental research, formation of groups and making some groups become experimental and some control are essential pre condition in order to know the effect of impact study. For this, of thirty subjects, ten subjects were selected from Aravali Public School, out of whom five each were randomly assigned to experimental and control group respectively. Another ten respondents were randomly assigned to experimental and control group from Shiv Public Senior Secondary School, and the remaining ten students were randomly assigned to two groups both experimental and control from Jeevan Jyoti Public School.

MATCHING OF GROUPS

In addition to groups formation, the matching was done concurrently among the experimental and control group. For this, they were made equivalent with respect to the grade, type of school being located in urban setting, English as medium of instruction, co-educational and privately managed and having common syllabi i.e., prescribed by Central Board of Secondary Education, New Delhi. The experimental and control group were also matched by taking pre test score and level of significance of Test of Written Language. Thus, the investigator after following all these criteria for the formation of groups, felt fully confident that experimental and control groups were similar in all respects that can reasonably be visualized except the treatment.

TOOLS USED

There were two types of tools used in the study, i.e., measuring tools and treatment tools.

MEASURING TOOLS

In order to identify students with dysgraphia, three measuring tools were used in the present study. These were
• Raven’s Standard Progressive Matrices (SPM)
• Teacher’s Observational Checklist
• Test of Written Language (ToWL)

**TREATMENT TOOLS**

The intervention programme was used as treatment tools for improving the writing skills of students with dysgraphia. The treatment programme was organized in proper manner and sequential order in day wise. The treatment programme was provided in thirty six days with twenty nine lessons.

**STATISTICAL TECHNIQUES USED**

For analyzing data both descriptive and inferential statistics were used. In the first phase of identifying writing skill deficits, the descriptive statistics like Mean, Standard Deviation and Percentages were used and in the second phase, inferential statistics i.e., Critical Ratio ‘t’ test was used for finding significant difference between mean scores of Experimental and Control group in pre test and post test of writing skills.

**MAIN FINDINGS**

On the basis of analysis and interpretation, the following findings emerged out which are highlighted in three sections. The **Section-I** deals with prevalence rate of dysgraphia and difference in mean posttest scores of experimental and control groups of students with dysgraphia after the implementation of the intervention programme. The **Section-II** highlights the mean pretest-posttest scores of students with dysgraphia in experimental group on the basis of the intervention programme and the **Section-III** reflects the mean pretest-posttest scores’ comparison of students with dysgraphia in control group.
SECTION-I

• The prevalence rate of writing disabilities among learning disabled students in public schools varies from 12.31 to 17.14 per cent with mean percentage 14.26.

• There exists significant difference in the mean gain score (14.77) of students with dysgraphia in experimental group at posttest level than the mean gain score (8.27) of students with dysgraphia in control group at posttest level on ‘Handwriting’ component of writing skills. It reveals that the students with dysgraphia in experimental group performed better than students with dysgraphia in control group on posttest after the intervention programme.

• The mean posttest score of students with dysgraphia of experimental group (34.13) was greater than mean posttest score of students with dysgraphia of control group (29.07) on ‘Correct spellings’ component of writing skills. Considering this result, it can be said that spelling performance of experimental group of students with dysgraphia showed positive trend than students with dysgraphia of control group on posttest after treatment programme.

• The mean posttest score of experimental group of students with dysgraphia (10.47) was lower than the mean posttest score of students with dysgraphia of control group (19.07) on ‘Incorrect spellings’ component of writing skills. It reveals that students with dysgraphia in experimental group produced less incorrect spellings after intervention programme as compared to students with dysgraphia in control group.

• There exists significant difference between the mean posttest score of students with dysgraphia of experimental group (60.15) and the mean posttest score of students with dysgraphia of control group (22.13) on ‘Written expression’ component of
writing skills. It can be said that writing fluency on narrative and expository text structure of students with dysgraphia of experimental group accentuated as compared to students with dysgraphia in control group on posttest after the intervention strategies were employed.

- The mean posttest score of experimental group of students with dysgraphia (.80) was lower than the mean posttest score of control group of students with dysgraphia (2.13) on ‘Incorrect letters’ of notes taking skill. It can be said that there was no difference between experimental and control groups of students with dysgraphia on posttest level after intervention programme. It further reveals that the performance of control group of students with dysgraphia increased even when there was no exposure to treatment programme.

- The mean posttest score of experimental group of students with dysgraphia (5.07) was lower than the mean posttest score of students with dysgraphia of control group (9.80) on ‘Incorrect words’ of notes taking skill. It reveals that students with dysgraphia in the experimental group produced less incorrect words after the implementation of the intervention programme as compared to students with dysgraphia in the control group.

- The mean posttest score of students with dysgraphia in experimental group (5.00) on ‘Missing words’ of notes taking skill was lesser than the mean posttest score of control group of students with dysgraphia (24.53). It means missing words of students with dysgraphia in experimental group on notes taking skill reduced considerably as compared to the students with dysgraphia in control group after intervention.

- The mean posttest score of students with dysgraphia in experimental group (16.73) was increased than that of the mean posttest score of students with dysgraphia in control group (5.00)
on ‘Correct sentences’ of notes taking skill. It highlights that students with dysgraphia in experimental group wrote more correct sentences than students with dysgraphia of control group in notes taking skills after the implementation of the intervention programme.

**SECTION-II**

- The mean gain score of experimental group at posttest (14.77) was higher than the mean gain score of experimental group of students with dysgraphia at pretest (6.53) on ‘Handwriting’ component of writing skills. It means that a set of intervention strategies had been found to have a significant positive effect on development of handwriting component of writing skills of students with dysgraphia.

- The mean posttest score of experimental group of students with dysgraphia (34.13) was greater than mean pretest score (27.47) on ‘Correct spellings’ of writing skills. It reveals that the intervention programme significantly improved the spelling performance of writing skills of students with dysgraphia.

- The mean posttest score of experimental group of students with dysgraphia (10.47) was lesser than mean pretest score (24.00) on ‘Incorrect spellings’ of writing skills. It shows that spelling errors of students with dysgraphia of experimental group gradually diminished after the intervention programme.

- The mean posttest score of experimental group of students with dysgraphia (60.15) was accelerated than mean pretest score (18.20) on ‘Written expression’ component of writing skills. It implies that the intervention programme i.e., Self Regulatory Strategy Development (SRSD) had remarkable impact on the ‘Written expression’ component of writing skills of students with dysgraphia in narrative and expository text.

- The mean posttest score of students with dysgraphia of
experimental group (.80) differed significantly from mean pretest score (3.00) on ‘Incorrect letters’ of notes taking skills. It reveals that the intervention programme had been found to be immensely helpful in notes taking abilities of students with dysgraphia or correct writing of letters.

- The mean posttest score of experimental group of students with dysgraphia (5.07) on ‘Incorrect words’ of notes taking skills differed significantly from their mean pretest score (13.06). It reveals that the experimental group of students with dysgraphia wrote less incorrect words after their exposure to the intervention programme.

- A significant difference was found in the mean posttest score of students with dysgraphia of experimental group (5.00) on ‘Missing words’ of notes taking than mean pretest score (24.53). It implies that number of missing words of students with dysgraphia of experimental group on notes taking skills gradually diminished after their exposure to the intervention programme.

- Significant difference was found in the posttest performance of experimental group of students with dysgraphia (mean=16.73) than pretest (mean=5.06) on ‘Correct sentences’ of notes taking skills. It highlights that students with dysgraphia of experimental group wrote more correct sentences after the implementation of the intervention programme.

**SECTION-III**

- No significant difference was found in mean posttests score (8.27) of control group of students with dysgraphia than mean pretest score (6.73) on ‘Handwriting’. It means the performance on handwriting of students with dysgraphia in control group remained similar. Marginal changes had occurred in alignment, letter spacing, word spacing, slant, and line quality components
of handwriting of writing skills.

- The mean posttest score of control group of students with dysgraphia on ‘Correct spellings’ (29.07) had not differed significantly than their mean pretest score (28.13). In the same way, mean posttest score of control group of students with dysgraphia on incorrect spellings (19.07) was not much different than the mean pretest score (20.60). It reveals that the performance of students with dysgraphia in control group did not change at posttest level due to lack of treatment i.e., designed intervention programme.

- The mean posttest score of control group of students with dysgraphia on ‘Written expression’ (22.13) was little greater than mean pretest score (19.20). It implies that the writing fluency in control group of students with dysgraphia had not shown any sign of improvement. Slightest changes had happened in ‘Organization’, ‘Mechanic’ sub-components of written expression of writing skills.

- No significant difference was found in the mean posttest score (2.13) of control group of students with dysgraphia on ‘Incorrect letters’ of notes taking skills than mean pretest score (2.13). It reveals that the performance of students with dysgraphia in control group was neutral due to the non-exposure to specially designed intervention programme.

- Significant difference had been found between the mean posttest score (24.53) and mean pretest score (26.06) of students with dysgraphia in control group on ‘Missing words’ of notes taking skill. It highlights that missing words in notes taking skill of students with dysgraphia of control group also reduced gradually even after no exposure to treatment.

- No significant difference had been found in the mean posttest score (5.00) of control group of students with dysgraphia than
pretest mean score (4.33) on ‘Correct sentences’ of notes taking skill. It reflects that the performance of control group of students with dysgraphia was neutral even though they were taught by conventional method.

EDUCATIONAL IMPLICATIONS

For Policy Planners and Administrators

As the present study shows that approximately 15 per cent of the total public schools students are suffering from dysgraphic syndrome, it is necessary for policy planners and administrators to take cue from this fact and make such policies which suit them. This fact can give a direction to policy planners and administrators to make appropriate policies for those children. This rate of dysgraphia is high enough to accelerate the dropout rate and degenerate the quality of education as writing is also exclusively related to school failure and academic retardation. If this situation persists for a long time without giving proper attention, the dropout percentage would augment with greater extent and the long cherished purpose of universalisation of elementary education and right to education of every child cannot be achieved. So, the present study would be an eye opener to all who are concerned with it because writing skill of the students has greater impact on academic achievement and professional endeavor. The study would have greater utilization and implications for easy identification of students with dysgraphia. It would also sensitize the national and state level personnel about writing issues which are an acute problem among these children. Although the study has been conducted in public schools, the same condition is bound to be found in other type of schools. So, the findings of the study can also help planners and administrators to look into the matter seriously. Hence, appropriate preventive as well as remedial measures should be taken from time to time through various plans and policies. The teachers and educators should be
made aware of this kind of problems among children.

So, it seems inevitable that some modifications are required in the existing policies such as incorporating learning disability as a type of disability which is right now not comes under the purview of Person with Disabilities Act (PWD), 1995 and RCI act. Some other changes like providing extra time and other facilities as given to the students who are visually challenged, can also be given to students of writing disabilities. It is necessary because these students cannot write at par with other children.

**For Teaching Community**

The findings of the study would have immense value to teachers and teacher educators. The findings would help to sensitize them about the prevalence of students with dysgraphia in all schools that leads to fiasco in scholastic and co-scholastic area. It would help teachers and teacher educators for the easy identification of students with dysgraphia in the classroom and outside through their observable behaviour. The findings would provide inputs to teachers and teacher educators about the needs of students with dysgraphia by giving extra time in examination, using oral method for evaluation, frequent use of computer for writing. The teachers should create conducive writing environment and instigate them to write more in order to build their self confidence and writing efficacy. The teachers should not discourage or rebuke even for minor mistakes in writing or messy writing. The study would throw light in view of problem of students with dysgraphia, a need to modify the existing curriculum, pedagogy and mode of evaluation. It would also have great value for teacher trainers and teachers to know about various types of intervention programmes for developing writing skills viz. handwriting, spelling, written expression and notes taking of students with dysgraphia. For the development of handwriting, the teachers could expose the students with activities such as clay
modeling, tracing, drawing on sand, clay and floor, joining dots etc. which would improve their writing skills. They can also use handwriting strategies like alphabet warm-up, alphabet practice, alphabet rocket, and alphabet fun for good handwriting performance. Further, the teachers should expose the students to a lot of coloring and drawing with enclosed space/pictures, so that they can have control over fine motor part of body which are pre-requisite for handwriting. They should encourage students to write short and simple assignments which give interest to them instead of focusing on long essays. They should divide a writing task into small units and also tell them to write few sentences in small parts from a story instead of writing the whole story in one go. They should make writing a regular activity by encouraging them to write from own experiences. They should encourage them to plan, brainstorm, organize, write, edit and revise, before writing anything. They should expose the students to multi-sensory approach, cover-write method, imitation method, repetition-drill method, word puzzle, phonemic-morphemic approach etc. for spelling skill development. In the classroom, teachers should acquaint the students with dysgraphia with various abbreviations, symbols, contractions along with column style and webbing style notes taking which would develop their notes taking ability. The above said strategies should be incorporated in the teacher training curriculum in order to acquaint and train the teacher educators and teacher trainees with knowledge and skills for educating the students with dysgraphia.

For Students

The present findings would contribute a lot to students with dysgraphia, in particular, and other students, in general, to solve their writing problem. The findings of the study focus on students to use regularly the strategies which would develop their writing skills. The activities can be such as shake and rub hands together, writing
on carpet and air, sand and clay writing, trace on clay or sand, string some beads, squeeze and twist various balls, select letters from newspapers by cutting and arrange them alphabetically, tear papers, cut papers and cardboard with scissor, roll clay between fingers, play marbles, hold and catch various things, coloring various pictures and figures for writing readiness together with the pre-writing activities such as scribble, trace curves from left to right, from up and down, horizontal and vertical direction in order to develop their visual perception, kinesthetic perception and gross-fine motor skills. These activities are prerequisite for appropriate handwriting. The students with dysgraphia should practice strategies viz. alphabet warm-up, alphabet practice, alphabet fun and alphabet rocket for development of both manuscript and cursive upper and lowercase letters writing skill. In addition, the students should do motor imitation of letters coupled with numbered arrow cues and memory retrieval that would be more effective for developing their handwriting fluency. Hence, it can be said that the improvement in handwriting performance among students with writing difficulties leads to gradual reduction of dropout rate in education and to improve the quality in academic performance along with to boost the confidence level of students.

The intervention programme has greater implications for students with dysgraphia in order to develop their spelling performance. The findings suggest that the students should practice some spelling strategies viz. letter proof reading, whole word correction, visual-auditory-kinesthetic approach, cross word puzzle game, word chunking (words within words, common letter pattern, base word, prefix and suffix), phonemic and morphemic awareness, spelling conscience through puzzle grid, word construction through game of anagram etc for developing spelling accuracy in writing words and sentences.
Moreover, the findings have greater utilization for students with writing difficulties to develop their written expression skills in narrative and expository essays. The use of self regulatory strategies improves the writing efficacy among students with dysgraphia in terms of organization, coherence, systematization and meaning fulness. This strategy helps them to plan, brainstorm and organize their thought process before actual writing through the use of mnemonic like POW+WWW, What=2, How=2 and POW+TREE, graphic organizers, visual organizers and picture prompts.

Furthermore, the findings have significant effect upon the notes taking abilities among students with dysgraphia. In order to write down or copy words and sentences from books, chalkboard and teacher’s dictation, students should be given practices in various types of symbols, abbreviations and contractions. The study contributed immensely by inculcating the value of tolerance, frequent practice, self confidence, self efficacy in writing.

**For Parents**

The present findings would give light to parents about the problems of students with dysgraphia. The parents should create congenial writing environment at home by allowing them to eat food by spoon, to draw and paint in clay or sand or floor; draw zig-zag and straight lines; play with blocks; use different pens etc. They should also encourage them to write letters, daily notes on diary; plan and write for a day; prepare house hold lists; prepare menu and recipes; prepare shopping lists; prepare holiday calendars; write thank you notes; sign name in the greeting cards; provide different width lined papers; arrange activities for sequencing and allow them to play games. At home they should allow their children to use computer for writing that would help them to correct spelling and written expressions. They should also make appropriate arrangement for their sitting by providing adequate height table and chair. They
should possess positive frame of mind and encourage their children for writing instead of harassing or embarrassing them.

**SUGGESTIONS FOR FURTHER STUDIES**

Research is a continuous process and the findings of this study cannot give final information by itself due to many limitations the investigator encountered during the process of research. In order to cope with the changing pattern of educational system, suggestions are required for further enquiry in this area and other related areas. Viz.-

- The study was conducted on writing disabilities of learning disabilities. The study may be further conducted in the other areas of learning disabilities.

- The study was taken on class VII students of public schools. The study may be undertaken by taking different classes and also Hindi medium schools.

- The sample for the study was taken from urban locality. The study may be further conducted by selecting sample from rural, semi rural, semi urban and slum areas.

- The present study is based on a small sample drawn from a limited number of schools. For the wider generalization a study can be undertaken by covering a variety of samples like Govt. schools, Govt. aided schools, urban schools, rural schools, girls’ schools, boys’ schools.

- The result of present study threw valuable light on some intervention strategies that have had positive impact on writing skills development. Other intervention strategies and new frontiers in writing instruction should be devised or developed and implemented in culture specific context for writing skills’ development of students with dysgraphia coupled with other students who have problems in writing.
Further, research is also needed to illuminate how and why task specific and self regulation strategies jointly contribute to the mastery of composition skills.

More research is needed to identify instructional settings and techniques that are both effective and feasible when strategies for composition and self regulation are to be integrated by teachers into the daily routine classrooms.

Further researches may be required to administer standardized tests to assess more exactly the added effects that self regulatory components of writing interventions have on students’ skill development.

Similar effort is needed to clarify whether students’ use of graphic organizers independently, is an effective strategy to enhance their writing composition. Researchers must also keep in mind both the type of graphic organizers (e.g., semantic organizers, framed outlines) and the duration of instruction as factors influencing how effective students’ use of graphic organizers independently can be at improving students’ writing comprehension.

Some related studies revealed that the word processing has contributed significantly in the writing performance of dysgraphic students. Hence, further study should be conducted with the use of word processor for spelling skills and composition skills development of students with dysgraphia.