

COMPENSATORY STRATEGIES FOR DYSGRAPHIC STUDENTS AT PRIMARY SCHOOL LEVEL

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Abstract

The Purpose of this study is to test the effectiveness of compensatory strategies for Dysgraphia students at primary school level, for this researcher used experimental methodology with pre-test, post- test quasi experimental design. The investigator selects 60 IED students from primary level students through stratified sample techniques. These students further divided into two equal groups. First group selected as control group and second group as experimental group for the present study. This study finds out that The obtained value of F_y is 8.82, which is significant at 0.01 levels. So it can be concluded compensatory strategies are effective for dysgraphic students in primary school students compared to the prevailing method. The difference between the adjusted mean of the post test scores of the students in the experimental and control group were tested for significance. And it differ significantly The difference between the adjusted Y means indicated that the students in the experimental group significantly in their development in the post test. From the results it can be interpreted that compensatory strategies are effective for dysgraphia students in primary school students.

Introduction

Language is the blessings which enables one to communicate effectively with other by means of work, gestures, signs and tone of voice in a multitude of situation Strong language skills are an asset that will promote a life time of effective communication. As a means of communicating ideas and storing information, written language is the single most important and far reaching technology available to humans. It is perhaps foremost among the many other fundamental social and technological advancement that have shaped our world. Writing is a complex skill that needs co-ordination of several abilities. But there are instances of disabilities. The disability or disorder associated with writing is called DYSGRAPHIA. (Chadha Anupriya 2001) A number of students in our society suffer from this problem. Various types of dysgraphia named Dyslexic dysgraphia, Motor dysgraphia and spatial dysgraphia make them awkward in their studies. As long as this problem persists these children cannot be brought to the main stream of the society. So these conditions must be changed.

Dysgraphia is a deficiency in the ability to write, primarily in terms of handwriting but also in terms of coherence. Dysgraphia is a transcription disability, meaning that it is a writing disorder associated with impaired handwriting, orthographic coding orthography the storing process of written words and processing the letters in those words), and finger sequencing (the movement of muscles required to write). It often overlaps with other learning

disability such as speech impairment attention deficit disorder or developmental coordination disorder. In the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV), dysgraphia is characterized as a learning disability in the category of written expression when one's writing skills are below those expected given a person's age measured through intelligence and age appropriate education. The DSM is not clear in whether or not writing refers only to the motor skills involved in writing, or if it also includes orthographic skills and spelling. The word dysgraphia comes from the Greek words *dys* meaning "impaired" and *graphia* meaning "writing by hand".

There are at least two stages in the act of writing: the linguistic and the motor-expressive-praxic stage. The linguistic stage involves the encoding of auditory and visual information into symbols for letters and written words. This is mediated through the angular gyrus which provides the linguistic rules which guide writing. The motor stage is where the expression of written words or graphemes is articulated. This stage is mediated by Exner's writing area of the frontal lobe. People with dysgraphia can often write on some level and may experience difficulty with other fine motor skills, such as tying shoes. However, dysgraphia does not affect all fine motor skills. People with dysgraphia often have unusual difficulty with handwriting and spelling which in turn can cause writing fatigue. They may lack basic grammar and spelling skills (for example, having difficulties with the letters p, q, b, and d), and often will write the wrong word when trying to formulate their thoughts on paper. A child may write a word completely different from what he had spoken, eg; He repeats 'Mary' when we say Mary', but when asked to write down, he writes 'John'. The reason may be a very strong inter-modal integration problem, a kind of graphic word finding disturbance. The child may repeat 'ball', nicely but when asked to write down, he cannot manage it and he writes 'bil' or something else. The transfer from mouth-image to written image is not correct. This is a kind of dysgraphia as a result of inter-modal integration disability [Rita Mary 2010]. The disorder generally emerges when the child is first introduced to writing. Adults, teenagers, and children alike are all subject to dysgraphia. Dysgraphia should be distinguished from agraphia, which is an acquired *loss* of the ability to write resulting from brain injury, stroke, or progressive illness. Many people who are dysgraphic will experience pain while writing. The pain usually starts in the center of the forearm and then spreads along the nervous system to the entire body. This pain can get worse or even appear when a dysgraphic is stressed. Few people who do not have dysgraphia know about this, because many with dysgraphia will not mention it to anyone. There are a few reasons why pain while writing is rarely mentioned:

- Sufferers do not know that it is unusual to experience this type of pain with writing.
- If they know that it is different from how others experience writing, they know that few will believe them.
- Those that do believe that the pain while writing is real will often not understand it. It will usually be attributed to muscle ache or cramping, and it will often be considered only a minor inconvenience.

Dysgraphia can interfere with a student's ability to express ideas. Expressive writing requires a student to synchronize many mental functions at once: organization, memory, attention, motor skill, and various aspects of language ability. Automatic accurate

handwriting is the foundation for this juggling act. In the complexity of remembering where to put the pencil and how to form each letter, a dysgraphic student forgets what he or she meant to express. Dysgraphia can cause low classroom productivity, incomplete homework assignments, and difficulty in focusing attention. Emotional factors arising from dysgraphia often exacerbate matters. At an early age, these students are asked to forego recess to finish copying material from the board, and are likely to be sent home at the end of the day with a sheaf of unfinished papers to be completed. They are asked to recopy their work but the second attempt is often no better than the first. Because they are often bright and good at reading, their failure to produce acceptable work is blamed on laziness or carelessness. The resulting anger and frustration can prevent their ever reaching their true potential.

Need and significance of the Study

Communication through writing is considered to be a complex human task to incorporate cognitive, perceptual, and motor aspects. In fact one of the prime tasks expected of a child in school is to write. Writing serves as a means of communication, used in order to express and report ideas and opinions. In the learning process, writing serves in organizing the learned material and in its memorization. Writing is regarded to be the fourth language skill to develop within a child after three prime developmental prerequisites- understanding, speaking, and reading.[Ezer, 1991; Sandbeck, Wolden&Zailer1995]. A child who is not capable of writing will have difficulty to communicate using this channel, and consequently this may affect his/her school performance along with the negative effect on the child's self-esteem.[Sassoon,1990]. The basic goals of handwriting instructions are to help students develop writing that is legible and can be produced quickly with little conscious attention. In the early elementary grades, considerable attention is directed at teaching students to form accurately and quickly individual letters. It is really important to help students, as soon as possible, develop a comfortable and effective pencil grip and posture for writing.

The teaching learning process of educational system prevailing in Kerala is not at all concentrating on the development of the writing skill of Learning Disabled children. It is because of the heavy syllabus and the examination oriented classroom activities followed by the mainstream schools in Kerala. Because of these reasons, LD students are most often neglected. They are even considered inferior to others. It is not the shortcomings of teachers but it is the fault of the educational system as a whole.

The investigator who has worked as a primary school English teacher happened to identify the pathetic condition of these LD students in writing English letters such as 'b and d'. The investigator thought of reclaiming these neglected students. But it was seen a difficult strategy to develop a writing skill in a short period. During her M Ed course, the investigator thought of the problem and was motivated to develop compensatory strategies to help dysgraphic students.

In the current literature, dysgraphia has received far less attention than dyslexia (Brunsdon, Coltheart, & Nickels, 2005). Moreover, most research studies (e.g., Rapcsak, 1997; Robinson & Weekes, 1995; Romani, Ward, & Olson, 1999) on dysgraphia have

emphasized on its theoretical aspects and neglected investigation of intervention strategies for children with such a learning disability. However, there has been a steady growth of research interest in studying various intervention strategies and their efficacies (e.g., Beeson, Hirsch, & Rewega, 2002; Luzzatti et al., 2000; Rapp & Kane, 2002) for agraphia, but few published single-subject or multiple single-subject intervention case studies of developmental dysgraphia (e.g., Brunsdon, Coltheart, & Nickels, 2005).

Compensatory Strategy:

In the present study, the investigator develops compensatory (equivalent) strategy for dystrophic students in primary school level which consist of circle formation, pasting beads, sand paper cut, groove tracing, figure method, which are developed and standardized with the help of supervising teacher.

Dysgraphia

It is a learning disability that affects people's writing abilities. It becomes apparent in the form of people having difficulty with spelling, handwriting and expressing thought on paper (National Center for Learning Disabled, 2009).

In the present study Dysgraphia is the deficiency in the ability to write (b and d), primarily in terms of handwriting but also in terms of coherence.

Primary School Children:

Primary school children can be defined as the children between the age 6 to 13 years or studied I to VII classes KER (1958).

In the present study the investigator takes IED students from I – IVth classes.

Objectives of the Study

1. To find out the effectiveness of Compensatory strategy on writing the letters 'b' and 'd' for dysgraphia students in Primary school level

Hypothesis of the study

Compensatory strategy is effective for developing writing skill on 'b' and 'd' among dysgraphia students in primary school level

Methodology in Brief

The investigator selects experimental methodology with pre-test, post-test quasi experimental design. The investigator selects 60 IED students from primary level students through stratified sample techniques. These students further divided into two equal groups. First group selected as control group and second group as experimental group for the present study.

Results and Discussion

Before commencing the experiment, the performance of the experimental group was compared with the performance of the control group by testing the significance of difference between means of the pre test scores of the two groups. For this, the mean and standard

deviation of the pre test scores of the two groups were calculated. The data and result of the test of significance are given in table 1

Table 1: Result of the test of significance of the difference between the means of pre-test scores of the Experimental and Control Groups

Group	No.of Students	Mean	Standard deviation	Critical ratio	Level of Significance
Experimental group	30	7.93	3.66	0.591	P > 0.05
Control Group	30	8.4	2.37		

Sources: Computed Data

The critical ratio obtained is .591 which is less than the table value at 0.05 level. This shows that there is no significant difference between the means of the pre-test scores of the pupils in the experimental group and control group. Therefore the two group do not differ significantly in their performance. So it is inferred that before experiment study the two groups were more or less the same ability. But still there is slight difference between the means of the pre test scores of the two groups. This necessitates the adoption of Analysis of Co variance technique to compare the performance of the experimental group and control group.

After the experiment, the performance of the pupils in the experimental and control groups were compared by testing the significance of difference between the means of post test scores of the group. For this, the mean and standard deviation of posttest scores of the two groups were calculated. The data and result of the test of significance are given in table 2

Table 2: Computation of Mean, Standard Deviation, Critical Ratio and Result of the test of significance of the difference between the means of post test scores of the Experimental and Control Groups

Group	No. of Students	Mean	S.D	Critical Ration	Level of Significance
Control Group	30	10.36	2.23	2.98	P < 0.05
Experimental Group	30	12.6	3.60		

Sources: Computed Data

The mean scores of the experimental group is 12.6 are greater than that of the control group 10.36. The critical ratio obtained 2.98 which is significant at 0.05 level. Since the experimental group is greater than that of the control group. It is inferred that experimental group is better than the control group. Hence , it indicates that there is significant difference between the Malayalam writing skill of the students taught through vowel activities. So it can be tentatively concluded that the writing difficulties of the experimental group is due to the effectiveness of compensatory strategies.

Gain in Performance

The difference between the pre test and post test scores of the pupils in the control group and experimental group are prepared and the mean and standard deviation are

calculated to find out the significance of difference between the means of gain scores. The data and result of the test of significance are given in table 3

Table 3: Result of the test of significance of the difference between the means of Gain scores of the Experimental and Control Groups

Group	No.of Students	Mean	S.D	Critical Ration	Level of Significance
Control Group	30	1.96	1.49	5.01	P < 0.05
Experimental Group	30	4.73	2.62		

Sources: Computed Data

The mean score of experimental group is 4.73 are greater than that of control group 1.96 the obtained critical Ratio is 5.01 which are highly significant at 0.01 levels. Since the mean experimental group is greater than that of the control group. It is inferred that experimental group is better than the control group.

Genuineness of the difference in Performance

The analysis of the post test scores and the gain scores of the pupils in the experimental and control groups show that there was difference in the performance of the two groups, the experimental group having an edge over the control group. But the two groups selected for the present study were non-equivalent classroom groups. Even though the difference in pre test is statistically not significant, it cannot be conclusively states that the pupils of the two groups differ significantly in their achievement in the post test by simply comparing post test scores or gain scores of the two groups. That is, the greater post test scores of the students in the experimental group than that of pupils in the control group cannot be attributed to the application of the experimental variables to the experimental group.

In this context, it became necessary to analyse the data by using the statistical technique called Analysis of Co variance (ANCOVA) in which the difference in the initial status of the two groups can be removed statistically. So, that they can be compared as though their initial status has been equated.

Comparison of Effectiveness of Compensatory strategies for Dysgraphic students at Primary School Level

The pre test and post test scores of the experimental and control group were subjected to the statistical technique of Analysis of Co variance to determine the **Effectiveness of Compensatory strategies for Dysgraphic students at Primary School Level**. The summary of Analysis of Variance of pre test (X) and post test (Y), taken separately is given in

Table 4: Summary of Analysis of Pre test (X) and post test (Y) scores of pupils in Experimental and Control groups, taken separately

Source	of	DF	SSx	SSy	MsxVx	Msy (vy)
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Variance					
Amongthe Group	1	3.27	79.34	3.27	79.35
Withinthe Groups	58	553.07	521.6	9.54	8.99
Total	59	553.07	601.		

Sources: Computed Data

$F_x=0.34$ $F_y=8.82$ From table 'F' $df=1/58$, F at 0.05 level =4, F at 0.1 level=7.08

The F ratio of two sets of scores was tested significance. The table values of F for 1/58 are 4 at .05 level and 7.08 at .01 level. Since, the obtained value of F_x is 0.34. It can be concluded that there is insignificant difference in the pre test scores of the experimental and control group. The obtained F_y is 8.82 which is significant difference in the post test scores of the experimental and control group. The final (Y) scores were corrected for differences in initial (X) scores. For that, the SS_y have been adjusted for any variability in Y contributed by X. The adjusted sum of squares of Y, that is SS_{yx} , were computed and the F ratio (F_{yx}) was calculated. The summary of Analysis of Covariance of pre test and post test scores of pupils in experimental and control groups is given in Table 4.9

Table 5: Summary of Analysis of Co variance of pre test and post test scores of pupils in Experimental and Control Groups

Source of Variance	df	SSx	SSy	SSxy	SSy.x	My.x	Sdy
Among the means	1	3.27	79.4	-16.103	104.06	104.06	1.99
Within the Means	57	553.07	521.6	404.1	225.16	3.95	
Total	58	558	556.33	601.0	388.83	329.22	

Sources: Computed Data

$F_{y.x} = 26.34$, from the table df 1/57, F at .05 level =4 F at .01 level=7.08

The obtained $f_{y.x}$ ratio was tested for significance. Since the table value of F ratio for 1/57 is 7.08 0.01 level of significance, the calculated value 26.34 is highly greater than the table value. Thus the obtained F_{ys} ratio is highly significant even at 0.01 levels. It is clear from the F_{yx} ratio that the two final mean which depends variables the experimental and control variable differ significantly after they have been adjusted for initial difference in the pre test scores.

Comparison of Adjusted Y means

The adjusted means for post test scores (Y means) of pupils in the experimental and control groups were computed using Correlation and Regression. The difference between the

adjusted Y means of post test scores of pupils in experimental and control groups are given in table

Table 6: Comparison of data for Adjusted Means of Post test scores of pupils in Experimental and Control group

Groups	N	M _x	M _y	M _{y.x}
Experimental Group	30	7.9	12.77	12.84
Control Group	30	8.4	10.4	10.20
General mean	60	8.17	11.52	11.58

Sources: Computed Data

SEd between the adjusted mean. $51, t = 5.15$

The difference between the adjusted means of the post test scores of the students in the experimental and control groups were tested significance. The calculated difference in Y adjusted means is 5.15. It is significance at 0.01 levels. From the result the method is effective for improving writing.

MAJOR FINDINGS OF THE STUDY

- The study reveals that the post test scores, ($t=3; p<.05$) of both experimental and control group differ significantly . Students in the experiment group acquired high score in the writing skill test when compared to the control group.
- 2rd conclusion is based on the gain scores ($t=5; p<.05$) of both experimental and control group differ significantly
- The F ratio for two sets of scores was tested for significance. The table value F for 1/58 is 4 at 0.05 levels and 7.98 at 0.01 levels. Since the obtained value of F_x is 0.34, it can be concluded that there is no significant difference in the pre test scores of the experimental and control groups. The obtained value of F_y is 8.82, which is significant at 0.01 levels. So it can be concluded compensatory strategies are effective for dysgraphic students in primary school students compared to the prevailing method.
- The difference between the adjusted mean of the post test scores of the students in the experimental and control group were tested for significance. And it differ significantly The difference between the adjusted Y means indicated that the students in the experimental group significantly in their development in the post test. From the results it can be interpreted that compensatory strategies are effective for dysgraphic students in primary school students.

EDUCATIONAL IMPLICATIONS

The present study was concluded in such a way that Compensatory strategies For Dysgraphic Students among primary school Level. On the basis of findings and generalizations, the following suggestions are made.

The suggested strategies are simple and it can be used without any difficulty .By using these strategies the problem in dysgraphic students can be reduced effectively. Hence it is recommendable for teachers to help the dysgraphic students.

- As the study has proved that the compensatory strategies for dysgraphic students in primary school level are effective, teachers can adopt this method for the same.
- The activities may be developed further by the expert hands and may be used for dysgraphic students.
- The lesson transcript developed for this research can be reviewed and can be used further.
- The techniques used in the research can be adopted for minimizing writing difficulties of dysgraphic students
- The research can be taken as work to compare with the prevailing teaching methods and can considerable changes.
- The present research can be used for further research related to the variables of the study
- These strategies can help policy makers, teachers, parents and those who are working in the field of Learning Disabilities .

CONCLUSION

Most people never consider the complexity and difficulty of the writing process. In fact, relative to all other academic activities, writing requires more basic skills than perhaps any other. Even during their earliest handwriting exercises, children must combine complex physical and cognitive processes to render letters precisely and fluidly. As writing tasks become more difficult, students must call on an increasingly wide range of skills to not only write legibly, logically, and in an organized way but also to invoke rules of grammar and syntax. This combination of requirements makes writing the most complex and difficult use of language.

It is probably no accident that many adults have chosen jobs that limit the amount of writing they have to do. Unfortunately, children have no such luxury. From first grade on, they write nearly every day and they are asked to do more with this skill than with any other except reading. And as children progress through school, writing requirements — from homework assignments and class work to note taking and tests — increase across the curriculum. Even newer high-stakes tests are moving towards requiring more answers in the form of short paragraphs and essays.

Like all learning problems, a writing disability can be devastating to a child's education and self-esteem and can dramatically limit what that child can achieve later in life. School requirements demand a high level of writing proficiency, and a child who struggles with an unrecognized writing disability will find it increasingly difficult to express his knowledge on many subjects, as the writing process itself will stand firmly in the way of learning. The present study focused on minimizing the problems faced by dysgraphic students .The strategies developed are quite child friendly and interesting .Though there are limitations the investigator attempted to present an effective approach and it seemed quite successful .The research intended to study an “Effectiveness of Compensatory Strategies For

Dysgraphic Students At primary School Level” and the result came out show that the study successfully has fulfilled it.

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