Improving Reading Fluency and Reading Comprehension with NIM-Assisted Teaching: An Activity Research

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Abstract

Reading fluency and reading comprehension are the most prominent characteristics of a good reader. In this study, the aim is helping the students who have reading deficiencies although they do not have any mental or physical handicaps to overcome their reading problems. For this purpose, The Neurological Impress Method (NIM) was applied accompanied by various activities that aim to develop the "Sight Words" capacities of the students in the process of *teaching how to read*.

Determining the influence of the *teaching how to read process* on permanence in reading and comprehension is the main purpose of the study. Two students who had insufficiency in reading although they did not have any mental or physical drawbacks were included in the study. The Activity Research Method was adopted in the study. Some adjustments were made in the process in order to increase the efficiency of the method used in the study (NIM). By doing so, the purpose was to improve the NIM process. The reading levels of the students in the study were determined by using the "Mistake Analysis Inventory". The levels of the texts used in the study were determined by using the "Fog Test". Also, additional data were obtained with the interviews with the students, teachers and parents. According to the results of the study, it was observed that "Neurological Impress Method", which was performed by converting the words in the text into Sight Words, ensured that the students acquired reading fluency skills, and improved their comprehension skills. In addition, it was also observed that NIM-assisted reading process, which was applied in the study, had a positive influence on the self-confidence of the students in terms of reading.

Introduction

Learning reading is one of the basic developmental duties that has to be succeeded with in early school years. As the educational process proceeds, reading skill becomes much more important in order for the student to gain the skill of acquiring information and learning freely. Right at this moment, what educationalists have to do is to make students discover their reading and writing mechanisms by taking into consideration their developmental characteristics and their future achievements (Ünüvar & Çelik, 1999).

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Harris and Sipay (1990) defined reading as "interpreting written texts in a meaningful manner"; Anderson, Hiebert, Wilkinson, and Scott (1985) as "establishing (building) meaning from written sources"; Perfetti (1985) as "thinking process in the light of written elements"; the Turkish Education and Teaching Guide as "the conversion of writing into meaningful sounds" or as "seeing the shapes of the words by the leaping of the eye on the lines, grasping the meaning of them and the vocalization process"; Kavcar, Cahit, Oğuzkan, and Sever (1995) as "the process of seeing, perceiving and grasping a text with its words, sentences, punctuations and other elements"; Demirel (1999) as "the conversion of the text into meaningful sounds".

The purpose of reading is building the meaning. However, all of the definitions are insufficient in terms of defining the characteristics of comprehension, and in terms of determining which elements are efficient in building the meaning (Akyol, 2001).

Especially with the realization of reading fluency, students will perform a more efficient process of building meaning, enjoy reading more and perform reading that is directed to the specific purposes, and use their reading ability functionally in every aspect of life. Fluency may be defined as the skill of reflecting the emphasis of a word read in a written text at a natural level (Richards, 2000). The National Reading Panel [NRP] (2000) defines fluency as "reading a text in a fast and true expression".

Giving more effort on the words to solve the meaning and reading the words more fluently is an important condition that may serve to understand what is read (Pressley, 2000; Bell, 2001). The important point here is the more efforts are shown to solve the meaning of the word, the less the capacity to understand what is read occurs (La Berge & Samuels, 1974).

Noticing the words automatically while reading a text is an important precondition in reading fluency. Because acquiring this automatism will ensure that the student solves and understands the passage simultaneously. By doing so, the effort and the load on the memory for reading will decrease. According to the surveys, students who acquire automatism remember things better and read more accurately. Meanwhile, reading accurately is a condition for fluency and as the reading fluency occurs automatically, the reader understands better (Samuels, 1999). In this context, it is considered that students' having the *sight words* is one of the basic precautions to ensure fluency.

The Sight Words are the words that are in written form; however, they are also easily noticed without being analyzed. Good readers have Sight Words or frequently-repeated words. They can make sense of some words by perceiving them as shapes before they read them (Black, Bogusz, & Porter, 1999). Reading with Sight Words is not a reading method, but is a process in which the words are brought from the memory while reading (Ehri, 1995). As children start school, they have very limited experiences about written language (Bouquett & Lindsey, 2008). According to Simmons (1992) and Tan and Nicholson (1997), the new-starters in reading not having the "Sight Words" affect Reading Comprehension and the reading motivation in a negative way.

Then, how can *words* be turned into *Sight Words*? Usually, the reader sees the word "dog" and can *diagnose* this word accurately, then, afterwards, recognizing the word "dog" becomes easier and faster. Performing something like knitting or driving, which you have learnt before, is hard, time-consuming and usually annoying at first. By practicing, these activities become easier, and after a while, they may be performed automatically. Similarly, recognizing a word accurately each time will make it easier to recognize it again in the future, and this word will become a frequently-repeated word. In order to perform reading fluency, a lot of reading studies must be performed (Richek, Caldwell, Jennings, & Lerner, 2002).

In this context, there are three things that bring the reader to fluency. The first one is the fluency being at the expected level; the second one is reading in an order is achieved by automatic recognition of the words; and the third and last one is expressing what is read in one's own words (Richards, 2000). There are various strategies that increase fluency. These strategies include repetitive reading, peer teaching, pre-screening and some phonological methods. By doing so, it is considered that comprehension will increase via increasing fluency.

There is no single fully effective strategy that may be used in all conditions. However, there might be some principles which are necessary for the students to understand the formation of the letters and words by sounds. It is observed that in sight word recognition, and in improving the comprehension, there are various applications like repetitive reading, reading aloud, independent reading, simultaneous and assisted reading, echo reading, chorus reading, paired reading, forming reader theatres, establishing learning centers, forming reading-writing environment, improving simultaneous listening and reading (Akyol, 2006; Black et al., 1999; Bouquett & Lindsey, 2008; Clay, 1993; Seago-Tufaro, 2002; Denton, 1997; Faires, Nichols, & Rickelman, 2000; Güneş, 2000; Hasbrouck, Ihnot, & Rogers, 1999; Kavcar et al., 1995; Mastropieri, Leinart, & Scruggs, 1999; Richards, 2000; Richek et al., 2002). Another method used in acquiring fluency and hence the capacity of reading comprehension is the Neurological Impress Method (NIM), which constitutes the basis of this study. NIM reading fluency model also helps controlling the pronunciation of the child. NIM allows the child to read without feeling the pressure of being corrected at any minute. NIM is the way of improving reading by supporting and without threatening. It is an enjoyable method of improving reading activities with the child. The purpose is improving reading style and fluency (Townsend, 1996).

The efficiency of Neurological Impress Method (NIM) was discussed along 1960s and 1980s, and after many years passed, this method attracted attentions again. NIM is a well-known method that reaches as far as Heckelman's study (1966 as cited in Flood, Lap, & Fischer, 2005). Heckelman said that he was not the person who discovered NIM, and stated that he only used the "Natural Language Feedback Method" on a student who had difficulty in reading to improve his pronunciation and language usage skills. The method used by Heckelman was based on the methods which were used for children who had stammering problems. According to the findings of the studies in which these methods were used, the sound that is re-directed to the inner side of the ear prevents stammering. Heckelman (1969) stated that after the study in which he applied 12-hour sessions and which he called as NIM, his female student, who had reading problems like stopping and repeating, improved 3 levels (as cited in Flood et al., 2005).

This *reading together* strategy, which is also called as Neurological Impress Method, includes a teacher and a student reading a text together. According to Heckelman, students read by imitating a model. This strategy is also efficient on adults who have difficulty in reading. The student and the teacher read aloud together in NIM. The application starts with a text which the student is at the independent level or with a text which has been read by the student previously. The teacher reminds the student that s/he should read fluently rather than read accurately, and does not allow returns during reading.

This method is especially proper for home activities because it does not require any preparations, and the only thing necessary is the material that is proper for the student's level. It is emphasized that when starting reading activities with NIM, it is proper to start from 2-3 levels below the student's actual level in his/her class (Myers, 2009).

Heckelman suggested that teachers increased the motivation of students during NIM process. Because the one-to-one interaction between teacher and student will give a psychological influence. In this context, in NIM process (Flood et al., 2005; Townsend, 1996; Lerner, 2000);

- The teacher chooses a text that is proper to the level of the student.
- The teacher sits next to the student in order to make him/her hear him/her better.
- The fingers of the teacher and the student should move simultaneously during reading.
- As the teacher says the word, s/he should move his/her finger under the word.
- The teacher should read louder and faster than the student and should be a good model during reading.
- It should be ensured that the student feels comfortable.

These steps were used in the study of Heckelman and covered reading fluency during the reading process rather than understanding.

In the application process, as the teacher continues reading louder and faster, s/he slows down when the student starts to gain fluency and read comfortably, and even may fall back from the student. However, if the student has difficulty in reading again, the teacher should save him/her from this situation.

Using this method may advance the skill of reading aloud, and if there is an improvement after 6 applications, the application should be ended. This method is proper for some students; however, it is not possible to claim that this is proper for every student (Richek et al., 2002). Instead of teaching easy texts, upper-level reading texts should be used as the time proceeds. A text consisting of 2000 words is used for a NIM session for 15 minutes.

One of the most important aspects of the NIM is that it makes us forget the ordinary reading approaches which we have ever heard of or thought of in order to improve the true reading process of children. Although the reading speeds of the children are sped up remarkably, the acquisition of vocabulary happens in a slower pace. The child should develop in such a way that s/he can read newspapers and magazines at home on his/her own and thus improve in a fast pace in terms of vocabulary acquisition and reading process (Myers, 2009).

The NIM Studies have been conducted by the researchers outside the daily classroom applications and the influence of these studies on fluency has been defined. The researchers agree on the issue that if the NIM is applied in a classroom environment, there will be problems in terms of classroom order and management (Hollingsworth, 1970; Mikkelsen, 1981). In this context, it is clear that in case this method is used in the classroom, there will be timing insufficiency problems. Besides, one of the drawbacks of the method, which is the adjustment of the voice of the teacher, was addressed by Hollingsworth (1970) in his study. He conducted a study with six Grade-4 students, and three of these students listened to the texts read by the teacher to the tape-recorder for 71.5 hours. However, there were no differences were detected between the students who listened to the voice of the teacher and who didn't. The reason for this has been claimed to be the missing points in the teacher-student relations. In this context, many researchers consider that applying this method through volunteering adults or trained peers will save time (McAllister, 1989; Strong & Traynelis-Yurek, 1983).

Although the studies on NIM have proven the efficiency of this strategy, there are some issues about classroom applications await investigation. These are; the properness of the specialists that are proposed to be trained in order to make the teacher save time or to help him/her; the need for finding an answer to the question on how much the NIM is efficient on small children, because Heckelman investigated the strategy with older children with learning difficulties; and the issue of how much time is needed in order to obtain an efficient result (Flood et al., 2005).

The Purpose of the Study

There are many studies that are focused on fluency and comprehension. The relevant studies have shown that children who have difficulty in understanding the texts they read slowly when compared with their peers and recognize fewer words (Allinder, Dunse, Brunken, & Obermiller-Krolikowski, 2001; Perfetti, 1985). All in all, is fluency a result of understanding well? Or, does fluency lead to understanding? These questions have not been answer clearly. However, according to many studies, there is a positive connection between reading comprehension and fluency. The relation between the two faces of reading should influence our teaching styles and methods.

In an efficient teaching process, performing only one method of approach does not lead to solution. Teachers' teaching fluency by using only one method is also a far possibility. This requires that many successful strategies are combined together to ensure that comprehension occurs and thus the speed and accuracy of reading also increase. Teachers and parents should be guided in terms of their goals that is their expectation of their children to read a text fluently and independently (Bouquett & Lindsey, 2008).

Right at this point, Neurological Impress Method (NIM), which aims to overcome the problems of a student who has insufficient reading skills although not having a mental or physical handicap, has been supported with various applications that aim to develop the capacity of "Sight Words" of the students. The purpose of this study is to determine the effect of Neurological Impress Method (NIM), which has been supported with pre-application and post-application processes, on fluency and comprehension in reading.

Method

The Activity Research Method was used during the study. The Neurological Impress Method was used after it was supported with various methods to improve fluency and reading comprehension. The main aim of the Activity Research Method is improving the application. Direct participation of the researcher ensures that the data are obtained from first hand. Since the study is conducted in real environment, it aims to solve the problems that exist directly. Direct participation brings with it the strengthening of individuals, cooperation and social change; and also eliminates the resistance that may emerge in the transfer process of the solutions into practice (Aksoy, 2003). The activity researchers arrange the data they receive in order to show the wrong applications and environmental dangers and make suggestions. Both qualitative and quantitative methods may be used in activity researches (Bogdan & Biklen, 1992; Patton, 2002; Yıldırım & Şimşek, 2005). In this context, it may be expressed that during the study the activity research approach has been adopted.

The reliability and validity of action research, as a qualitative research method, differs from the quantitative research. For this purpose, suggested that researchers can establish the validity and trustworthiness by addressing the credibility, transferability, dependability, and confirmability of their studies and findings. First, a researcher must take into account all the complexities in the study and address problems that are not easily explained (i.e., credibility). The researcher should also include descriptive, context-relevant statements so that someone hearing about or reading a report of the study can identify with the setting (i.e., transferability). Remember, qualitative researchers believe that everything they study is context-bound and do not seek to draw conclusions that can be generalized to larger groups of people. Therefore, qualitative researchers should include as much detail as possible so others can see the setting for themselves. The researcher should also address the stability of the data collected (i.e., dependability) and the neutrality and objectivity of the data (i.e., confirmability) (Gay, Mills, & Airasian, 2011).

In this regard it is stated that researcher bias most probably influence the action research. To eliminate this problem, referring to expert opinion in the planning and applying, data collection, determining the study group, implementation of experimental procedures and analysis the data phase, will contribute the research perform consistently (Büyüköztürk, Çakmak, Akgün, Karadeniz, & Demirel, 2013). Therefore in the research at each stage of the process, determining the study group, selecting action, implementing the action and changing the implementation of action, was decided in consultation with the three researchers who are experts in the field.

Data Collection Tools

In determining the levels of the texts used in the study, the "Fog Test" developed by Wellington (2002) was used. In order to determine the reading levels of the study, the "Mistake Analysis Inventory", which was adopted by Akyol (2011) from Ekwall and Shanker (1988) was used. Besides, the "Student Information Form" developed by Richek et al. (2002) was used in the interviews with the teacher, student and parents after being adapted to Turkish.

The "Fog Test", which is one of the international formulas used in determining the legibility of a material, includes the following processes (Wellington, 2002: *A sample paragraph containing 100 words is chosen. The average number of the words in each sentence is measured to give the average sentence length (S). The percentage of the words having 3 or more syllables in the sample paragraph is measured and the average value is found (N). Then the Class Level = 0.4 x (S + N) is calculated. The reading age that is needed for the reading material can be obtained by adding 5 to the result.* In the research, it was aimed to catch up with a level of standards through the "Fog Test" for the subjects that they read the text. The text read by students has led researcher to build of a standart because of possibility that texts sometimes is easy and sometimes is diffucult for the students. At this point the readability formulation (Fog Test) was applied by the researcher.

In this research "Mistake Analysis Inventory" was used for the identification and evaluation reading and comprehension mistakes. "Mistake Analysis Inventory" consist of a Guide to Understanding Keyword and Determining Percentage that was adapted by Akyol (2001) from Ekwall and Shanker (1988) and Vocalizing and Environmental Scales from May (1994). Inventory consists of four parts: error type and symbols, word recognition and determine the percentage guide, question scale and levels of understanding spreadsheet.

In "Mistake Analysis Inventory", the questions prepared according to simple and deeper comprehension are scored to determine the level of students. According to this, for the Simple Comprehension Questions: "2" points for the questions that are answered in full. "1" point for the questions that are answered in half. "0" points for the questions that are not answered at all. For the deep comprehension level questions: "3" points for the questions that are answered in full. "2" points for those giving the answer more than half despite some missing points. "1" points for the questions that are answered in half. "0" points for the questions that are not answered at all. Then the types of errors are identified during reading aloud and being converted to numeric expression, word recognition level and percentage is determined. By determining the levels of understanding from students' answers to the questions, the student's reading level are determined. Inventory identifies three types (free level, level of teaching, level of anxiety) of reading levels. In determining these levels, reading levels and percentage criteria was used, adapted by Akyol (2001) from Ekwall and Shanker (1988).

Table 1. Reading Levels and Percentage

Reading Levels	Word Recognition	Comprehension
Free Level	%99+	%90+
Level of Teaching	%95+	%75+
Level of Anxiety	%90-	%50-

Free Level tells about a child's reading and understanding a text that is proper to his/her level without the help of a teacher or an adult. *The level of teaching* is the level at which the child can read at the desired level with the help of a teacher and an adult. *The Level of Anxiety* is the level at which the child understands very little of the text s/he reads and/or s/he makes too many reading mistakes.

Reading Texts

The reading passages in the Turkish Language Classroom Book, which is suggested by Ministry of National Education, Head Council of Education and Morality Management for 3rd Grades, and which were used in the study of Uzuner (2007), was used in the study. The "FOG Test" was used in order to determine the legibility levels of the texts used in the study according to the ages of the students and the findings are given in Table 2.

Table 2. The Readability Level of the Texts the "FOG Test" Results

Name of the Text	Number of Words	Readability Age Level	Grade
Collective Work (Pre-Application)	225	8	2
Visit to a Patient	297	8	2
Death of the Cherry Tree	545	8,8	2
Magic Cake	310	8,4	2
Welcomed Guest	206	7,8	1
'Seeing' Birds' Songs and the Smell of the Oven	291	9,6	3
Bear Hunt	119	8,4	2
The Discovery of the Coal in Our Country	397	9,1	3
Three Butterflies	238	8,3	2
Flood Water	174	7,3	1
The Girl who was Ashamed on the Mirror	241	7,5	1
Reading Habit	194	8,1	2
The Stars and the Picture in the Sky	174	8,4	2
The Cracked Bucket	176	8,3	2
The Old Oak-Tree (the Last Application)	217	8	2

The Activity Process and the Applications

The activity process and the processes consist of case determination studies, preparing the activity plan, applying the activity plan, and evaluating the reading fluency and reading comprehension. The processes that are applied in this stage are explained as follows.

Case Determination Studies

Firstly, the study was discussed with the Guidance Service of the School and then pre-interviews were made with the teachers of the students who were planned to be included in the study. The "Mistake Analysis Inventory", which was developed by Akyol (2011), Ekwall and Shanker (1988) to determine the reading levels of the students, was used to determine the class levels of the students in terms of reading fluency skills.

After the levels of the students were determined, the parents of the students were notified and information was given on the study to be conducted after the necessary permissions were received and they were asked to give the sufficient support at home for the study during the application. The Semi-Structured Interview Form was used in order to give the study a different viewpoint and to increase the reliability of the obtained data.

Subject 1

Subject 1 is a girls attending to Primary School 4th Grade. Subject 1 did not mention of a specific game that she liked to play in the interviews, and stated that she liked the games that were played with the crowd together with her class. Subject 1 stated that she read books at school in classes together with her friends; however, she especially liked the silent reading activities in the classroom. She said that the teacher used a method in which one student went on reading the passage from the place where the previous student left in the classroom. Subject 1 stated that she could not love this application because she got bored when she had to go on from the place where her previous friend left because she could not find the place where s/he was. In addition, another issue that bothers Subject 1 is the addition of drama practices in reading classes. According to Subject 1, the teacher, especially the English teacher constantly gives the right to speak to two students. Subject 1 states that sometimes she cannot understand what she is reading and at this point her friends interfered and this made her upset.

The thing that Subject 1 did not like in Turkish Language books is the long reading passages. Subject 1 stated that their teachers performed visual reading activities about the reading passages and the homework was usually about the reading passages in the form of answering questions about the passage. Subject 1 also stated that she could not see the board because she was sitting at the back row in the classroom; however, nowadays, she was sitting at the third row from the front side in the classroom. She also stated that she confused the words while reading and read them in syllables. She was asked about the reason for this and she said that the teacher did not give her the right to speak in the classroom, most probably as a defense mechanism.

When Subject 1 was asked about the reason of people's reading, she said that they read to speed up their reading. She stated that when she encountered an unknown words, she looked it up in the dictionary; and if she could not find it in the dictionary, she asked an adult. Her favorite texts are poems, stories and then informative texts. Subject 1 thought that she was most successful in mathematics classes, and unsuccessful in English classes. She stated that she got bored especially when she was reading texts consisting of 5-10 pages in Turkish Language classes. In addition, she stated that she liked to draw pictures about the reading passage before reading the passage.

In the interview with the teacher of Subject 1, the teacher said that Subject 1 started school at a normal age without any delay, and she did not have any absenteeism at first; however, she was one of those who started reading the last in the classroom. This year she was absent and ill continuously, and did not attend school one day a week[1]. According to the teacher, Subject 1 is a very quiet child and she has a reluctance to attend school. The teacher stated that she made efforts to overcome this situation.

According to the teacher, Subject 1 has problems in reading inflected long words and long sentences and still tries to read by combining syllables[2]. The teacher stated that since Subject 1 focuses on reading fluency, she misses the meaning. She does not have any problems in writing, listening and visual reading. However, the teacher also stated that Subject 1 did not make any interpretations in visual reading process, and only expressed what she saw.

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[1] The researcher has had to change his working hours and postpone the study several times during the study because of this problem.

[2] According to the researcher, this problem of Subject 1 occurs due to pronunciation problems rather than reading deficiency. Because Subject 1 was asked to say and repeat words that included the letters such as -r and -ğ in a text without making her read. However, it was determined that the student had difficulty in the pronunciation of these words, and was asked to study tongue twisters as a homework.

The *reading teaching* approach that is adopted by the teacher is based on following one other during reading aloud. In addition, the teacher uses stories, novels etc. besides the classroom book. The teacher said that the other lessons of Subject 1 were bad. According to the teacher, Subject 1 performs the four operations in mathematics without any mistakes, but when it comes to two or three-sentence problems, s/he has problems. In addition, Subject 1 delayed his/her homework, and did not attend extra studies, and acted reluctantly in reading. The reason for this, according to the teacher, is the situation of the family in which she lives[3].

According to the teacher the expression skills of Subject 1 are missing a great deal. She has difficulties in expressing her thoughts. She prefers to make up few sentences. According to the teacher, Subject 1 is an introvert child. She does not raise finger and does not want to speak. However, her relations with her friends is good and she does not have any social inconsistencies. She has a few friends. She likes painting. There are some problems in performing extracurricular responsibilities. S/he always delays things. In short, According to the teacher, Subject 1 is a student learning with difficulty and a less careful student. S/he is introvert, emotional, and avoids duties and responsibilities. According to the teacher, Subject 1 is not a happy child. The teacher said "Perhaps Subject 1 is aware of our expectations and this becomes a burden for him/her." However, other teachers stated that Subject 1 had sisters and they also had similar problems at school.

Subject 2

Subject 2 is a girl from Grade 4. Subject 2 stated in the interviews that she loved the reading activities; however, she also stated that she could not understand what she read when some of her friends spoke in the classroom. She said that she did not like the reading activities in which one student continued from the place where the previous student left during reading, and the drama activities. Subject 2 stated that one of the activities that she liked most was solving problems on the board. However, according to Subject[i] two students are always invited the board to solve problems. She answered as "People read to be wise" to the question "Why do people read?", which is different from Subject 1. She stated that she would consult an adult when she had difficulty when she was reading something that she did not know. Subject 2 has no support at home for her lessons; however, Subject 2 receives extra study support at school. She loves reading poems, stories and then funny reading passages. Subject 2 also stated that she was not bored while reading long passages; however, she could not adjust her breath and got tired. In addition, she said that she got bored mostly while she was doing her social and science homework. The simplest lesson for Subject[i] is mathematics as examinations.

According to her teacher, Subject 2 started school at normal time. However, she broke her arm at the beginning of the 2nd Semester of the 1st Grade. She could not attend school for nearly 1.5 month. According to her teacher Subject 2 is a highly active child. She never sits properly on her desk; and when she sits on her desk, she sits on her knees and could not stand still without moving. Therefore, the teacher stated that Subject 1 and Subject 2 are completely opposite to each other.

The teacher gives such an example: "*Let us say there is a study about Turkish Language, and there is a question asking "What did you understand from this activity?", and I asked the students to write their answers. Subject 2 wrote a sentence like "in this activity" again and again repeatedly. This is a behavior that is intended to cheat me. There is no thinking and interpreting in Subject 2. However, she does not have any difficulty in visual reading and listening. When given very short texts, Subject 2 can comprehend the information; however, this information is not at the Grade 4 level. We faced the comprehension problem at Grade 2, naturally. Since I focused only on reading at Grade 1 and therefore I could not sense the comprehension problem.*"

"*Subject 2, just like Subject 1, can make the 4 operations when faced with. However, in questions with problems, Subject 2 adds the numbers in the questions and brings it to you*" says the teacher. "If I say, 'No, this is wrong', this time Subject 2 subtracts them." According to the teacher, this situation stems from the fact that Subject 2 does not understand the problem. In addition, the expression and interpretation skills of Subject 2 are limited. Subject 2 is enthusiastic about reading and always keeps her finger in the air throughout the lesson. Although irrelevant, she says something.

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[3] The teacher was consulted in detail several times about this, and this situation was kept in mind during the study.

The Situation on Subject 1 and Subject 2 before the Application

One of the most important factors that influence the reading skills of Subject 2 is, according to the researcher, the student's breaking her arm when she was in the 1st Grade. Because when she was absent because of her broken arm, the teacher was busy with syllable and reading studies. In the second grade she was not in a position to pass the grade; however, the teacher supported her and made her pass the grade. In addition, it is considered that Subject 2 being too much active and her having diffused interest also influence her reading-writing skill especially her comprehension skills. During the study, Subject 2 did not sit on the chair for a certain time but wandered in the room. Therefore she could not focus her attention on reading passages. On the other hand, her reading skill is at a further level when compared with that of Subject 1. Her teacher and her mother stated that Subject 2 dreamt a lot.

Her teacher said:

"Sometimes Subject 2 tells herself something or sings or watches outside. When I ask them to write the answer of a question in the classroom, Subject 2 also writes; however, mostly write something that is completely irrelevant. For example, she takes the first paragraph of a text in the book and writes it repeatedly."

This situation is considered as the reason of some of the behaviors of Subject 2 by the researcher. After the study, when Subject 2 was asked questions on the reading text, Subject 2 looks firstly at the reading text and repeats the first sentence as an answer, and then makes irrelevant sentences. Again, she repeats some sentences in the text as if she had lived them herself or as if they are of her own.

Subject 1, on the other hand, is a student who has a fluent reading problem. It was stated by her teacher that Subject 1 had problems in receiving help from her family outside the school. This opinion of the teacher was noticed by the researcher throughout the study. In addition, it was also noticed that Subject 1 also had writing problems. It was understood that when asked to read what she wrote, Subject 1 read what she was thinking, or what she believed should be, instead of reading what she wrote. Although Subject 1 could read some words, she had difficulty in pronunciation. It is considered that this situation influences her reading skill in a negative way. When she encounter long and inflected word, especially words inflected with the letters -r and -ğ, she had difficulties in reading or pronunciation.

Before starting to work with these students, the researcher made them read a text which was for 4th Graders, and after it was observed that they were at the anxiety level, the evaluation was made according to the text which was at the level of Grade 2 and the findings are given in Table 3.

Table 3. Pre-measurement values of the Subject 1 and Subject 2

Reading Texts	Reading Durations	Number of Errors	Word Recognizing Percentage	Comprehension Levels	Number of the Words in the text	The FOG Level of the Text
Collective Work*	5min. 31s.	63	73%	58%	225	8 age
Visit to a Patient *	4min. 29s.	36	87%	41%	297	8 age

*Subject 1 **Subject 2

When Table 3 is examined it is observed that Subject 1 read a text consisting of 225 words in 5 minutes 31 seconds, made 63 reading mistakes, and the comprehension level was 58%. Subject 2, on the other hand, read a text consisting of 297 words in 4 minutes 29 seconds, made 36 mistakes, and the comprehension level was 41%. It is observed that although the reading performance of Subject 2 is higher than Subject 1, both of them were at the "anxiety" level before the application.

Application of the Action Plan

The application started at the beginning of the second term of the academic year and lasted until the end of the second semester. The study lasted approximately for 44 hours and 36 hours of it was allocated to application process of the strategy that was determined to overcome reading difficulty. In general, a 3-Stage process was followed in the study.
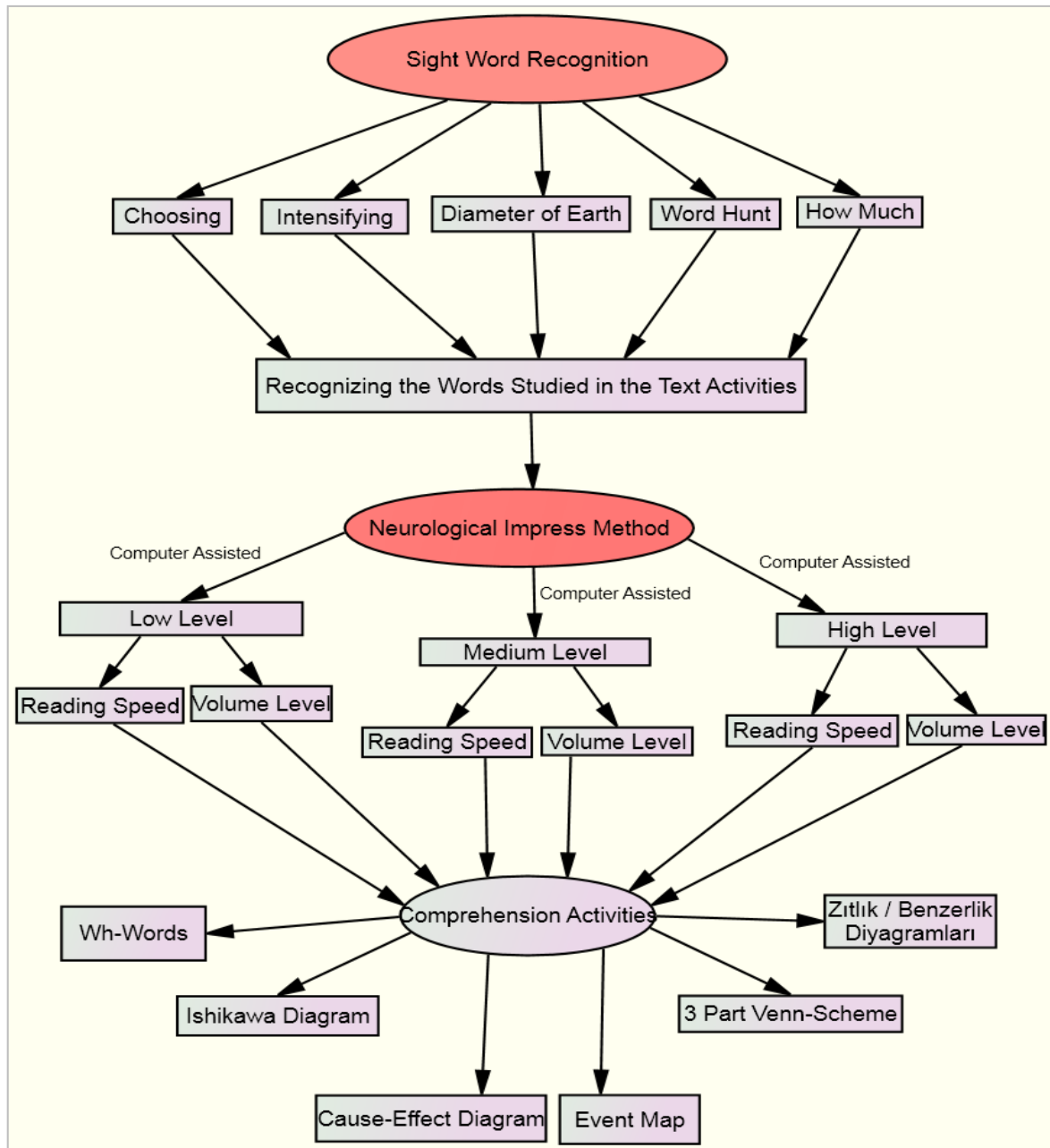

Figure 1. Neurological Impress Method Application Process

In the first stage, studies on the words of the text which was intended to help the students develop their fluent reading skills were performed. By doing so, the aim was to increase the influence of NIM process. Vocabulary acquisition studies were performed to ensure that the students acquire the words in the text and read the words at first sight without separating them into syllables. By doing so, the students who study the words in the text will read the text more comfortably, and while this activity increases the fluency in reading, it will also influence the motivation of the student for reading in a positive way. The techniques like choosing, intensifying, the diameter of the earth, word hunt, and "how much?" were used in converting the words to be learnt into acquired words (Black et al., 1999; Richek

et al., 2002). After these strategies were applied, the reading passage was given to the students and they were asked to highlight the words they studied on. In addition, a "powerpoint" presentation was formed from the word list which were intended to be converted into Sight Words. In this presentation, the words appear on the screen in various speeds that are proper to the level of the student. With this application, it was aimed that the student would recognize the word at once without separating it into syllables. By doing do, it was aimed that the students would pay more attention to those words in the NIM process, and remember the pronunciation of the words more easily. In addition, this application was used with the aim of giving the students the comfort to recognize the words and make them acquire self-confidence. Especially with Subject 2, because she had difficulty in focusing on the text, she was made to focus on the key words in the passage and their meanings with the applications performed with word cards and with other vocabulary acquisition activities and she was assisted in making sense of the text.

Similarly, Subject 1, who received the application in the study, had problems in reading fluency. The researcher noticed during the study that Subject 1 could not even pronounce some words even if she knew the word. Subject 1 had difficulties mainly in pronouncing the words that included the letters such as –r, -l, -ğ –s, -ş and that were rather longer. She had difficulties many times in words and read again and again. The researcher acted according to the property -even the starting point- of NIM which has been mentioned above, and foresaw that the problem would be overcome by Subject 1. However, the researcher noticed some drawbacks in NIM application in which the teacher and the student acted in interaction and as the teacher read and the student followed simultaneously.

The application process of NIM has been mentioned in the literature section of the study. In this context, some changes were applied in the application of NIM in this study. The reading process, in which an adult performs faster and more aloud than a student due to the carelessness or indifference of the students may be interrupted frequently.

This is an important situation that requires attention in NIM because the process of NIM must not be interrupted (Flood et al., 2005; Myers, 2009). In order to overcome this problem, the researcher read and recorded the passage at various speeds before each application. Then the NIM process was performed by making the student listen via the computer while the student was reading the text, and the researcher checked whether the student followed or not or whether the student heard sufficiently or not. The students who listened via earphones from the computer could focus more on the text and thus the problems of NIM were handled with.

In the comprehension studies, some "reading comprehension" tools that were prepared by the teacher were used. These are the tools like fishbone, cause-effect diagram, Wh-Questions, event map, 3-Section Venn Schemes, contrast and similarity diagrams. By doing so, it has been aimed that the students separate the text into various meaningful forms and situations, perceive and make sense of them. The simple questions or the questions that had deep meanings were not asked to the students directly; rather, they were asked in various worksheets and sometimes as homework; however, in the last application, worksheets were not used, instead the questions that were on the worksheets were asked directly. By doing so, the issue of whether the worksheets used had an influence on comprehension was investigated.

Evaluating Fluency and Comprehension in Reading

After action plans were applied, the performances of Subject 1 and Subject 2 in terms of reading fluency and reading comprehension were determined and the efficiency of the application was evaluated. In this context, the reading fluency and comprehension levels of Subject 1 and Subject 2 at the end of the application are given in Table4 below.

Table 4. Post-measurement values of Subject 1 and Subject 2

Reading Texts	Reading Durations	Number of Errors	Word Recognizing Percentage	Comprehension Levels	Number of the Words in the text	The FOG Level of the Text
Old Oak-Tree *	3 min. 57s.	7	97%	71%	217	8 age
Old Oak-Tree **	2 min. 41s.	6	97%	75%	217	8 age

*Subject 1 **Subject 2

While in the pre-application, Subject 1 read a text of 225 words in 5 minutes 31 seconds (Table 3), she read it in 3 minutes 57 seconds in the last application. In the pre-application, Subject 1 made 63 mistakes in total, and had 73% word recognition. Her reading errors were 7.

There is an increase in comprehension level when the basic questions and the questions that require deep comprehension are handled in terms of pre-application and post-application. The comprehension level of the Subject 1, who had 58% comprehension level at the pre-application process, increased to 71% in the post-application. When the points of the students received from word recognition level and percentage determination guide and the points from the answers that are given to comprehension questions are investigated in reading level calculation table, it is observed that Subject 1 improved with the post-application.

In the pre-application, Subject 2 read a text which consisted of 297 words in 4 minutes 29 seconds (Table 3); she read a text consisting of 217 words in 3 minutes 57 seconds. It is observed that Subject 2 made 36 mistakes in total in the pre-application, and had 87% word recognition level. In the post-application, Subject 2 had 97% word recognition level and made 6 reading mistakes. When the simple questions and the questions that require deep comprehension are considered in terms of pre-application and post-application, an increase is observed again. The comprehension level of Subject 2 in pre-application was 41%, and it increased to 75% in the post-application. It is observed that Subject 2 improved her reading and comprehension skills with the post-application.

In the interviews with the students after the application, it has been observed that students developed positive attitudes towards the study. In addition, it has also been observed that students have positive attitudes for reading activities. They stated that they got bored in the beginning of the study, but later they read more comfortably and with self-confidence. Students especially mentioned the benefits of NIM process which was performed with the help of the computer by the researcher. They said that the most beautiful side of the study was that it sped up their reading. The students stated that in the past when their teacher selected them for reading they only read for one or two lines and selected another student, but now, the teacher always selected them for reading. According to them the most beautiful side of this study is that it sped up their reading and they started to recognize words more easily. It is another aspect observed in the students that they developed a self-confidence in reading.

Discussion and Results

In order to develop the fluency and comprehension in reading of two students who has learning difficulties in terms of basic reading skill, firstly, the words in the text were converted into sight words i.e. Sight Words, and for this purpose, various strategies were made use of. Then, NIM process was applied and afterwards, reading-comprehension skills were improved with various worksheets. By doing so, the issue of whether there is a change in reading fluency and comprehension skills was investigated. The findings show that the use of "conversion of the words of a text into *sight words*" and Neurological Impress Method" together is influential in developing fluent reading and comprehension skills. The students who were at the anxiety level before the application were supported with Sight Words activities for 36 hours and it has been observed that the teaching level increased after NIM application.

These results suggest that if the text is made into a body in which the words of the text become Sight Words and the use of Neurological Impress Method has a boosting influence in students' acquiring reading fluency skills and developing comprehension skills. When the relevant literature (Monroe & Staunton, 2000; Richek et al., 2002) is examined it becomes clear that the "acquired words" that are developed by the students during the reading fluency process make them read the texts more fluently.

However, it has been determined that NIM increased the reading fluency level of Subject 1 in an intense level, while it pulled the comprehension level of Subject 2 to a higher level. In this context, when the challenges of Subject 1 in pronunciation of the words and in some letters are considered, and the problems of Subject 2 in concentrating are considered, the level that is reached in acquisition of the application. It is considered that NIM process being applied alone will have influences in reading fluency.

In order to achieve fluent reading, lots of reading work should be performed with students. Unfortunately many students who have reading problems do not enjoy reading and even escape from reading as possible. Because they do not read in a comprehensive manner and can not have the sight word. Thus, unable to have adequate sight word will make it more diffucult to read. And such a vicious cycle will ocur (Richek et al., 2002).

However, it has been observed that the NIM that is supported with activities designed for the purpose of forming Sight Words before the application, and with various worksheets after the application will make more contributions both to reading fluency and to formation of meaning and to acquisition of vocabulary. It has also been observed that the students who can read more comfortably have positive attitudes for reading. As Seago-Tufaro (2002) states in his work that students reading comfortably without being bored develop positive attitudes for reading, and this fact is observed in relevant literature.

In another study that was conducted to see whether the needs of students in improving reading were covered, it was observed that the program reached some goals like improving and fastening the reading levels of the students. The accurate words read by the students who were in the reading development program per minute were evaluated, and it was observed that the accurate reading rates increased to 84% in May, while it was 57% in January. Another result that is worth mentioning is the situation in which the students answered comprehension questions in 88% accurately with the improvement process, which means that there has been an increase in 22%. This shows that students can read and understand the texts that are in their educational levels rather than in texts that are in challenging levels (Denton, 1997). Again, the positive results of NIM application have been expressed in the studies of Flood et al. (2005).

However, it has been observed that NIM has some limitations in terms of the adjustment of the level of the voice of the teacher and in terms of classroom management. Besides, although students are reminded before the application that the reading process should not be interrupted, students often find ways to interrupt the reading in one way or another. In order to eliminate these drawbacks, it has been considered beneficial that the teacher reads the text and records it in various speeds before NIM application and the student both listens and reads the text with earphones. In the study of Heckelman (1969 as cited in Flood et al., 2005), which was conducted on students who had stammering problem, it has been found that the voices that are redirected to the ear in NIM process prevent stammering. Heckelman (1969) stated that after the study in which he applied 12-hour sessions and which he called as NIM, the female student who had reading problems like stopping and repeating improved 3 levels (Flood et al., 2005). It has been observed in this study that the use of the voice recording of the text via earphones in NIM process decreased especially the stammering problem of Subject 1 during reading and increased the speed of reading.

In NIM-assisted reading teaching process held with two students who had insufficiency in reading and comprehension, the students imitates the voice and cannot direct his/her interest to anything else except the text. The only limitation of NIM being not applicable in a classroom is thus eliminated. It is considered that the teacher's reading a text and recording it especially in a laboratory and then students' listening to this will be sufficient in eliminating this problem. It is also considered important for the individualization of the teaching that right at this point the teacher's giving the freedom of choosing one of the texts that are read in various speeds in NIM process. Meanwhile, using this method accompanied by computer will be motivating for the student and enable teachers to know various applications. However, it is also considered important for the achievement of the application that the teacher uses various applications before NIM by using the words in the text to make them become Sight Words.

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