The effect of Direct Instruction on corrective reading skill for students with intellectual disabilities

Bagher Ghobari Bonab a, Hasan Jafari b, Fatimah Nosrati* c

*PhD. Associate professor, Department of Psychology and Education of Exceptional Children, University of Tehran, Faculty of Psychology and Educational Sciences, Al – Ahmad Ave, Tehran 141556456, Iran
bMA. Azad University, Birjand, Iran
cPhD. Assistant Professor School of Psychology & Education University of Tehran, PO BOX 1445983861, Tehran, Iran

Abstract

The purpose of the present study was to examine the effect of direct instruction on reading accuracy for students with educable intellectual disability.

Method: to achieve the stated goal, a single subject design was applied. In the baseline the entry level of the target behavior was recorded. Whereas, in the intervention level after application of the direct instruction target behavior was assessed seven students with intellectual disabilities were participated in this study. Ten sessions of direct instruction procedure each session consisted of 45 minutes was applied for each student.

Result: analysis of data comparing the baseline data with intervention phase revealed that all subject improved in reading as a results of direct instruction in reading accuracy. Theoretical implication and practical application of the study have been delineated in the original paper.

© 2014 Published by RRAMT France Ltd.

Keywords: Direct Instruction, Intellectual Disability, Reading Accuracy.

1. Introduction

Direct Instruction is a behavioral based explicit teaching that is designed to decrease failure of minority, and underachiever students who fail to accomplish in school like their medium and high achiever peers (Gersten & Carnine, 1984; Grossen, 2004). Watkins and Slocum (2003) asserted that “Direct Instruction Programs enable Students to learn more efficiently because of it reduces unrelated information and focuses on learning strategies that can be broadly applied across numerous examples, problems, and situations. Teachers using Direct Instruction help students to use a systematic approach where students develop skill in layers (Kozioff et al, 2000). When students learn one skill, teacher take steps further by teaching a more difficult skill, or by applying the skill to a more challenging problem. By initially using a teacher directed approach and them gradually moving to independent activities, teachers are helping students master the skills taught (Gerstein & Carnine, 1986). In regard to reading research showed that
Direct Instruction was effective for teaching reading and reading comprehension to elementary school students, and for teaching middle and high school students in remedial courses. Direct Instruction has been high an effective approach specially for learning disabled and mentally retarded students. The following studies support effectiveness of Direct Instruction in educational settings. Adam and Engelmann (1996) meta analyzed 34 studies related to Direct Instruction and found an average effect size of 0.97 per variable studied for Direct Instruction an indication that Direct Instruction was highly effective.

Borman, Hewes, Overman, and Brown (2003) examined studies pertaining to 29 comprehensive school reform modals. Among the interventions categorized as having the “strongest evidence of effectiveness” (Direct Instruction, School Development Program, and Success for AA). Direct Instruction was found to have the largest average effect size (0.21) and to be grounded in the greatest number of studies. That is 49 studies containing a total of 182 comparisons. The remaining interventions were generally based on less rigorous evidence and fewer studies, and were found to procedure widely varying in effect sizes.

Hattie (2009) synthesized the results of previous meta-analyses of various factors that have been investigated with regard to effects on students achievement, Direct Instructions was found to be one of the most effective teaching strategies. Four metal-analyses that included DI were examined. Across 304 studies, 597 effects, and over 42,000 student, he found an average effect size of 0.59 with similar positive results (0.99) for both regular and special education students. Moreover, Przychodzin and Collegues (2005) reviewed 28 studies and found positive results for Direct Instruction, corrective reading in 26 of them. White (1988) studied the effects of Direct Instruction in special education using Meta-analyses method on the published articles in this area (25 articles). The results showed the effectiveness of Direct Instruction procedure.

Kamps and Collegues (2008) compared effectiveness of three program in reading mastery including programmed reading, Reed Well, and Direct Instruction. They sampled 87 students in kindergarten and examined the effectiveness of these methods in reading mastery. They that concluded Direct Instruction was the most effect, in method (ES= 0.66). Although accumulative data showed the effectiveness of Direct Instruction in reading, there is a spare of research in the effectiveness of Direct Instruction in learning new worlds and mastery of reading fluency. Current study has been developed to fill the gap in this area.

Reading is an essential means to school achievement and the base of instructional curriculum; failure in curriculum occurs in great extent because of incompetency in reading skills. Therefore, functional reading, writing, and means of having limited ability to meet one's daily needs, and incompetency in these basic skills means inability to respond one's needs and thus equals incompetency in functional reading. The present study, the effect of using direct instruction on correction of reading skills for students with intellectual disability has been investigated. Although, the effect of this method on reading and on math achievement has been studied in some European, North American countries and Canada, the effect of this method in the field of reading difficulties has not yet been examined in Iran.

Direct Instruction is a prevalent method that is used in behavioral paradigm is supported with experimental data. This method implies regular organizing and presenting instruction, encourage explicit teaching of concepts and skills, and to advocate practicing teacher-oriented activities. Rosenshine and Stevens (1986) studied the effectiveness of this method and found that, direct Instruction techniques, provides necessary cues, gradually fading these clues based on students' progresses, using of correctional feedback and immediately reinforcing student's appropriate behavior, regular assessment of student's progress, and providing sufficient exercises contributed to the efficiency distinctive features of this method. Direct Instruction was developed out of working with regular, educationally delayed and mentally retarded students of primary schools and preschool children. This method included teaching students with special needs in addition to other groups of students. This method consists of a distinctive combination of the most effective educational joint operation in regular and exceptional education classes. It emphasizes on formulating
program and its precise procedures presenting materials and delivering cues in a more systematic ways. Although numerous studies on utilization of Direct Instruction with various regular and exceptional groups by Carnin and his colleagues has been conducted; however, in Iran, this method in reading competency has not been tested yet. The present study, therefore, plans to examine the effectiveness of this method in important of reading accuracy in students with intellectual disabilities in Iran.

In other countries there are many studies on the effectiveness of direct instruction in reading comprehension reading accuracy as well as mastery in reading for students with intellectual and development disabilities. These studies confirm the effectiveness of direct method education in teaching reading skill (Engelmann, Becker, Carnin & Gersten, 1988). Considering inadequacy of researches in this field in Iran and dearth of research in this field, researchers decided to study the effect of direct instruction on learning and improvement of reading accuracy for students with intellectual disabilities. Investigating the effect of direct Instruction on generalization of learned items, and maintaining them include the other areas was another aim of conducting this study. In addition, it is possible to regard the utilization of this research results and findings for applying on-the-job teachers training programs and prior to their employment. Moreover, the findings will help to understand the efficiency of this method in reading competency and extends theoretical coverage of the model.

2. Method

The present study was a single subject experimental design with multiple baselines. That multiple baseline across individuals. The first stage of this Study (A) was called the baseline stage, and the second stage (B) was called an intervention stage. In the first stage target behaviors was repeatedly observed precisely under natural conditions, and the frequency of its occurrence was recorded. In this study, the problem was reading skill of students with intellectual disability that was observed under natural condition. In this research children’s reading accuracy was observed, and the obtained result was presented by drawing baseline data.

In the second stage, behavior change or experimental condition on target behavior was presented. Introduction of experimental condition on individual’s behavior was applied in this study. Based on the magnitudes of the changes in data in intervention phase we can conclude that the researcher has achieved its goals, and it is assigned as a successful project.

2-1. Instruments

The following instruments were used in this study: Good-enough Draw-A-Man Test, and Reading Inventories. These instruments are illustrated in the following sections.

2-1-1. Good enough Draw-A-Man Test:

Draw-A-Man Test is a nonverbal intelligence testing scale that was developed by Goodenough-Harris (D.B. Harris, 1963). In the revision, as in the original that, emphasis was placed on the child's accuracy of observation and development of conceptual thinking. Credit is given for the inclusion of individual baby parts, clothing details, proportion, perspective, and similar features. A total of 73 storable items were selected on the basis of age differentiation, relation to total scores on the test and relation to group intelligence test score.

Data for this purpose were obtained by testing sample of 50 boys and 50 girls at each grade level from kindergarten through the ninth grade in urban and rural areas of Minnesota and Wisconsin, Stratified according to father’s occupation.

The reliability of the Good enough-Harris Drawing Test has been reputedly investigated by a variety of procedures. In one carefully controlled study of the earlier from administered to 386 child and fourth grade school children. The retest correlation after a one week interval was estimated 0.68, and split-half reliability was 0.89 (McCarthy, 1944).
Rescoring of the identical drawings by different scorer yielded a scorer reliability of 0.90, and rescoring by the same scorer correlated 0.94 studies with the new form (Dunn, 1967, D.B. Harris, 1963).

In order to assess students intellectual functioning a nonverbal IQ test named Draw-A-Man Test.

Draw-A-Man Test was used to assess intellectual functioning of the mental retardation. Although these students were studying in special education classes, and they had a diagnostic label, however, for more information about their intellectual functioning this test was used.

2-12. Reading Inventories

To measure educational progress (i.e. reading proficiency) 10 contexts of sixty-words-texts appropriate for students with intellectual disabilities were developed which were, comprised of subject matters of their text books; and since these text books matters have been written from simple to difficult, thus the sample texts were selected more from middle of their books. Attempts were made to develop text have are homogeneous and consistent regarding the number of difficult and simple words.

The reliability of this text was examined through consulting with five experts of educators of exceptional children and by obtaining their responses. This test was a Likert type scale, in which scores ranged from 1 to 5 in each item.

To determine the reliability of the test, one of the experts of exceptional education was asked to record his judgment on student's performance while he was reading the text. The result, then, compared with researcher's idea, and contingency coefficients obtained. In one of the texts, one researcher found and recorded 17 mistakes for the student, while another researcher distinguished 15 mistakes (for that same text). Therefore, they had strong agreements with each others. There were altogether 58 items about which experts agreed; and with regard to total numbers of text words, a contingency coefficient of 0.97 obtained. Therefore, inter-rator reliability shows the adequacy of the for utilization in educational settings.

2-2. Procedure

Forty students with mild intellectual disabilities were recruited from Center for Vocational Skills in Bam city as participants in this study. They were given 10 sixty-words in textual format, each day one text. Under natural conditions, the texts were read by students, and after 10 sessions of gathering baseline data for each student. Intervention phases was started. Prior to the establishment of treatment package. The Good enough Draw-A-Man Test was administered on students and analysis of the result showed that these students had mild intellectual disabilities.

Then, every day a text was given to each single student so that the number of student's incorrect readings was recorded by the teacher. The conditions of testing regarding the environment and time of the test were accurately controlled in order that a natural setting and proper time were provided for participants; thus the test was performed at 9 to 10 A.M every morning, it was recognized that at this period of can a good sample in time sampling procedure.

The aim was to draw the baseline and characterize the student's reading abilities during the baseline phase. After every session of reading, the number of student's mistakes was recorded and after 10 sessions the reading of 10 texts were completed by all students. Baseline data was drawn on the basis of the number of errors so that a baseline and an intervention stage would be drawn for each of students.

2-3. Intervention phase

Examining the baseline data, and comparing the errors, in the baseline and intervention phase we found that with finding the difficulties in reading, decreased as function of intervention program. In other words study revealed that identifying vowel and consonant’s differentiating vowels, and consonant, from each other was the major issue.

In addition, more importantly problem of these students combining vowels and consonants. The subjects who have less problems in distinguishing the letters were usually those who began the treatment course by using direct instruction with emphasis on phonological problems.
2-3-1. Phonology-based learning method
In this method, the foundation was comprised of an inductive hypothesis of learning. That is to start from specific problems and continue toward making a rule based on specific data. Phonemes (vowels and consonants blending) as the smallest components of language, will be considered competent. Spees, Case and Molloy (2003), believe that education for reading and writing skills should began with instruction of vowels and constants letter through learning language, and then, by combining these phonetic elements, larger ingredients, named syllable, words, and sentences will be developed. This method, in contrast to the letter-focused method, contradicts using the names of alphabetic letters in instruction of reading skill. In this study, every subject participated in a 10 sessions before treatment, that constituted the baseline, and 10 sessions, in treatment sessions was compared. Details of the study will be illustrated in methodology section.

3. statistical analysis
In the present study, descriptive data have been used in three features: Figures of target behaviors, frequency tables, and percentage indexes. Figures concerned target behaviors of 7 students with reading difficulties have been presented below.

By observing every student's figure one can compare the degree of student's progress during the course of treatment. As an example, in figure 1, concerned performance of a student with intellectual disability constant movement in data points has been observed. However, in treatment stage the figure shows decrease in the rates of behaviors. This trend reveals that every treatment session has had a positive effect on reading difficulties. In the last sessions of treatment this positive effect increases in degree as in the tenth treatment sessions the number of mistakes in the sixty-words-text decreased to tin sixty. This trend in declaration indicates the success of treatment package. This matter is also evident for other subjects' figures related to the effectiveness of treatment course. In figure (8) multiple baselines data have been shown with using different individuals (7 persons). As seen in this figure, the baseline began on the same day for all of the subjects; treatment stages did not began in identical dates, variations in the treatment initiation dates controls for extraneous variables including history. Therefore, by observing the figure (8), one may conclude that all subjects had achieved very good progresses in the area of reading skills after implementation of direct instruction, and their reading mistakes in texts have been decreased.
Figure (1) Performance of the first student with intellectual disability in mastering reading words (Vocabularies)

![Graph showing performance of first student](image1)

Figure (1) shows that during the baseline the student’s academic behavior varied between 13-15 with a medical score of 13.5 while the same target behavior has been decreased dramatically during the intervention phase. In the intervention phase finally the student’s mistake have to two errors in sixty words.

Figure (2) Performance of second student with intellectual disability

![Graph showing performance of second student](image2)

As you see in the figure (2) during the baseline tempo of variations are fairly constant and range of variations are between 14 and 16 while in the intervention phase number of errors reduced dramatically. Finally as indicated in the figure, number of error reaches to two in 60 words that presented to the participants.

Figure (3) Performance of third student with intellectual disability

![Graph showing performance of third student](image3)
Figure (3) indicated that the curve in the baseline was relatively constant and fluctuates between 12-14, and its median equals to 13, while students' mistakes have been dramatically dropped in treatment stage and decrease in errors continued with an decelerating slope and in the last stage it amounted to 2 errors in 60 words, with a median of errors equals to 7.5 in this stage.

Figure (4) indicated that the curve in the baseline was relatively constant and fluctuates between 17 to 20, with a median score of 18.5. while the students' number of mistakes have been reduced dramatically, and this trend continued with an decelerating slope, and this trend continued to four errors in 60 words in treatment stage. The median of errors in this phase was 12.
Figure (5) shows that students' behavior in the baseline is relatively constant and fluctuates between 8-11, with a median of 9; while the students' mistakes have been dramatically dropped in treatment stage and this trend continued with a decreasing slope, and in the last stage it amounted to zero in 60 words, and the median in this stage was 4.5 in the sixty words text.
Figure (6) Performance of sixth student with intellectual disability

Figure (6) indicated that in the baseline the regression line was relatively constant and fluctuates between 10-13, with a median of 12; while the students' mistakes in treatment stage have been dramatically reduced, and the trend continued with an declining slope, and in the last stage, it amounted to 1 error in 60 words, with a median of 4.5 for this subject.
Figure (7) number of errors in 60 words content for each subject
The seventh diagram showed that behavior of interest, target behavior somehow was study and fluctuated only between 12-14 errors with a median of 12.5. On the other hand during the treatment phase the number of errors reduced dramatically and finally research to zero.

Table (1) Number of errors, for each subject during baseline and intervention phase

<table>
<thead>
<tr>
<th>Subjects</th>
<th>Baseline phase</th>
<th>Intervention phase</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total numbers of errors</td>
<td>Mean Errors</td>
</tr>
<tr>
<td>1st Subject</td>
<td>137</td>
<td>13.7</td>
</tr>
<tr>
<td>2nd subject</td>
<td>146</td>
<td>14.6</td>
</tr>
<tr>
<td>3rd subject</td>
<td>129</td>
<td>12.9</td>
</tr>
<tr>
<td>4th subject</td>
<td>182</td>
<td>18.2</td>
</tr>
<tr>
<td>5th subject</td>
<td>93</td>
<td>9.3</td>
</tr>
<tr>
<td>6th subject</td>
<td>113</td>
<td>11.3</td>
</tr>
<tr>
<td>7th subject</td>
<td>130</td>
<td>13</td>
</tr>
</tbody>
</table>

As indicated in Table (1) total numbers of errors, means of error’s in reading sixty words which is sampled as a reading test total number of errors in calculated by counting subjects errors ten sessions. Means score in obtained by dividing the total score by the number of sessions. After implementation of Direct Instruction (DI) total number of errors reduced dramatically, for instance in the case of the first 69 errors. That is a significant reduction in the number of errors.

Statistical Analysis

In addition to the graphic displays that represent improvement of reading and reduction of errors during the treatment phase. Inferential statistics were used to calculate the significance of changes from the baseline to the intervention phase. Implantation of the appropriate statistics for frequency comparison ($\chi^2$) lead to the following conclusions.

Table (2) Testing the significance of differences between baseline and treatment data for the first subject

<table>
<thead>
<tr>
<th></th>
<th>O</th>
<th>E</th>
<th>O-E</th>
<th>$\chi^2$</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline</td>
<td>137</td>
<td>103</td>
<td>34</td>
<td>21.78</td>
<td>0.001</td>
</tr>
<tr>
<td>Treatment</td>
<td>69</td>
<td>103</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

As you see in Table (2), the magnitude of $\chi^2$ exceed the critical value, and we conclude that reduction of errors due to treatment procedure was significant for the first subject ($\chi^2 = 21.78$, $P < 0.001$).

Table (3) shows the analysis of differences in number of errors during the baseline and treatment phase.

Table (3) Testing the significance of difference between baseline and treatment phase number of error for the second subject

<table>
<thead>
<tr>
<th>stages</th>
<th>O</th>
<th>E</th>
<th>O-E</th>
<th>$\chi^2$</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline</td>
<td>146</td>
<td>116</td>
<td>30</td>
<td>15</td>
<td>0.001</td>
</tr>
<tr>
<td>Treatment</td>
<td>86</td>
<td>116</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
As indicated in Table (4) the magnitude of $X^2$ exceeded the critical value, and it is concluded that reduction of errors due to treatment procedure was significant for the second subject, $\chi^2 = 15, P< 0.001$.

<table>
<thead>
<tr>
<th>stages</th>
<th>O</th>
<th>E</th>
<th>O-E</th>
<th>$\chi^2$</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline</td>
<td>129</td>
<td>98</td>
<td>31</td>
<td>18.98</td>
<td>0.001</td>
</tr>
<tr>
<td>Treatment</td>
<td>76</td>
<td>98</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

As indicated in Table (4) the magnitude of $X^2$ exceeded the critical value, and it is concluded that reduction of errors due to treatment procedure was significant for the third subject ($\chi^2 = 18.98 P< 0.001$).

Table (4) shows the performance data for the 3rd subject.

Comparing baseline data with intervention phase for the fourth subject indicated that treatment was successful in reducing errors significantly. The following Table (6) shows this statistical evidence.

<table>
<thead>
<tr>
<th>stages</th>
<th>O</th>
<th>E</th>
<th>O-E</th>
<th>$\chi^2$</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline</td>
<td>182</td>
<td>145.5</td>
<td>36.5</td>
<td>17.80</td>
<td>0.001</td>
</tr>
<tr>
<td>Treatment</td>
<td>109</td>
<td>145.5</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

As shown in Table (5), the magnitude of $\chi^2$ exceeded the critical value. It was concluded that reduction of errors due to the treatment procedure was significant for the fourth subject ($\chi^2 = 17.80 P< 0.001$).

Table (5) Testing the significant of difference between baseline and intervention phase for the fourth subject.

Analysis of data for the fifth subject revealed that number of error in intervention phase reduced dramatically. Table (6) represents these data.

<table>
<thead>
<tr>
<th>stages</th>
<th>O</th>
<th>E</th>
<th>O-E</th>
<th>$\chi^2$</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline</td>
<td>93</td>
<td>68.5</td>
<td>24.5</td>
<td>16.8</td>
<td>0.001</td>
</tr>
<tr>
<td>Treatment</td>
<td>44</td>
<td>68.5</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

As indicated in Table (6) the magnitude of $\chi^2$ exceeded the critical value. Therefore it was concluded that reduction of errors due to the treatment procedure was significant for the fifth subject ($\chi^2 = 16.8 P< 0.001$).

Table (6) Testing significance of differences between baseline and intervention phase for the fifth subject.

Analysis of data using chi-square showed that number of errors in treatment phase reduced dramatically. These results were shown in Table (7).

<table>
<thead>
<tr>
<th>stages</th>
<th>O</th>
<th>E</th>
<th>O-E</th>
<th>$\chi^2$</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline</td>
<td>113</td>
<td>79.5</td>
<td>33.5</td>
<td>27.38</td>
<td>0.001</td>
</tr>
<tr>
<td>Treatment</td>
<td>46</td>
<td>79.5</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Considering the critical value of $\chi^2$ (P< 0.001), that is 6.74, we conclude that the amount of $\chi^2$ in higher than critical value, and is significant in P< 0.001. Then we conclude that difference in baseline data and intervention phase is higher.
than critical value. Therefore we conclude that for the 6th subject, the significant improvement has been occurred as a result of intervention.

| Table (8) Test of difference in frequencies in baseline and intervention phase for subject seventh. |
|---|---|---|---|---|
| P | X² | O-E | E | O |
| 0.001 | 34.66 | -40 | 90 | 130 | Baseline |
| 0.001 | 34.66 | -40 | 90 | 50 | Intervention |

As indicated in table (8), test of significant for categorical data ($\chi^2$) showed that difference between baseline and intervention data cannot emplace by chance (H0 is rejected). We conclude the significant differences existed between baseline and intervention phase. Therefore, number of errors reduced significantly for subject 7th as a result of implementing Direct Instruction.

4. Discussion

The Present study examined the efficacy of direct instruction methods on improvement of reading achievement of children with mild mental retardation. Success in reading scale is common basis for success in all educational fields. Failure in educational programs increasingly happens because failure of reading achievement. In many countries Direct Instruction successfully has been used. However, in Iran with different cultural background efficacy of this method on improving reading achievement haven’t been measured. The following process was applied in conducting the current research.

Seven students with reading difficulties were selected from 40 students with intellectual disabilities and direct instruction procedures were implemented on them during 10 sessions. Gradually student’s errors in reading decreased as sessions were conducted. In the final session (Session 10) student’s errors in reading decreased to one or two errors in 60 words and in some of the students. The rate of target behavior (student’s errors) reduced dramatically (i.e. to zero level).

Chi square test showed meaningful and significant changes occurred ($p \leq 0.01$). Studies (Engelmann and Colleagues, 1988) explained that Direct Instructional programs were successful in improving student’s achievement up to national norms. Moreover Direct Instruction was an effective procedure in improving cognitive skills such as comprehension and main idea recognition. It was also effective in emotional regulation children with difficulties present study was compatible with body of research (e.g. Kuder, 1991; Carlson, Francis, 2003).

David Cook in his research (2002) pointed that Direct Instruction played a major role in success of 76 students with reading difficulties. Results indicated that comprehension skills of these students improved up to 2.7 grades point average as a result of Direct Instruction. In the present study also after intervention number of reading errors reduced up to half and in some cases it reduced errors mote than 75 percents. Teachers reported effectiveness of Direct Instruction in some other content areas such as math concepts, as well as in reducing aberrant behaviors (Stockard, 2010).

Engelmann and Colleagues (1988), White (1988), also explained that Direct Instruction not only was effective in phonological teaching, math concepts and linguistic abilities, academic achievement, but also played an important role in improving self-confidence, improvement of attitudes about learning and reduced anxiety.

Present study was consistent with investigations done by Gobari-Bonab and Mirakhorly (2008) that showed direct instruction method was effective with students with mental retardation.

According to results of the studies like Rosenshine and Stevens (1986), and present study, Direct Instruction method is very effective method in primary school education. This method played an effective role in special education too.
In the present study we taught subjects who were developmentally delayed. They also encountered with major academic failures due to their intellectual disabilities abilities of these students and improved their self-esteem. Therefore, utilization of Direct Instruction will lead to the remedial of reading problems which is source of major academic problems in most areas.

Due to the problems of time restraints, we did not conduct a follow-up study in this investigation; therefore maintenance of treatment gains cannot be inferred from this study. Current intervention has theoretical implications and it can lead to practical application as well. Among different application of the finding it is necessary to mention it applicability in curriculum modification and teacher training.

6. References


