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Schools with strong features and poor performance in reading literacy achievement in PIRLS 2006

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Abstract

This study is to identify factors among high and low schools and their impacts on Iranian students’ performance. The Study is done based on obtained data from questionnaires filled out by teachers and schools participated in PIRLS 2006. The method of separating schools into two groups of high and low (19 high schools and 59 low schools) is based on (+, -), 5 Sd from the whole class mean. The findings shows that among all factors related to schools performance two variables of teachers’ experience and density of students in class are significant factors in distinguishing schools into high and low.

Keywords: PIRLS 2006, reading literacy, high and low performance schools, primary students in grade four

1. Introduction

The PIRLS* study focused on the achievement and reading experiences of children in 35 countries in 2001 and in 40 countries in 2006. The study includes a written test of reading comprehension and a series of questionnaires focusing on the factors associated with the development of reading literacy in fourth grade. This study is conducted every five years under the supervision of the IEA, among participating countries.

PIRLS will help educators and policymakers by answering questions such as:

- How well do fourth-grade students read?
- How do students in one country compare with students in another country?
- Do fourth-grade students value and enjoy reading?
- Internationally, how do the reading habits and attitudes of students vary?

National and international findings of PIRLS provide a set of reliable information and data for educational systems of member countries to enable them to compare the performance of reading literacy of their own students to that of other participating countries (Martin and Mullis -2004). One of the most important factors in such a study is to assess the performance of various schools as adjudged by the PIRLS 2006 and to survey the characteristics of high and low- schools. By analyzing the assorted factors at play and recognizing the weak and strong points of these

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schools when compared with each other can provide practical suggestions for principals, policy makers and parents
and teachers in schools. The national findings of PIRLS in Iran and the findings of the international report of PIRLS,
and scientific and research articles in this issue show that the performance of some schools in comparison to other
participating schools in PIRLS has significant advantage in terms of sources and facilities, teaching procedure,

Regardless of the types of the schools – whether public, or private - researchers and education experts have
always faced two special questions with respect to school characteristics. Firstly, it pertains to the curriculum,
human resources and facilities and educational procedures, equipments, and school structure… Secondly, it relates
to how suggestions can be provided for other schools through recognizing and separating related factors of their
performance in terms of the importance they have in the educational progress of students.

Large numbers of international researches have studied the characteristics of high school performance

The most significant findings of these studies are:
1-school environment and its motivating area
2-facilities and human resources
3-teachers’experience and their years of service
4-weekly training school hours
5- density and the number of students in each class in school
7-resources used to teach reading in school

The research on the impact of school factors in terms of professional competence of teachers, density and the
size of classroom, school environment and conditions, and educational equipments in the process of teaching-
learning have been conducted by the researchers such as Reynolds (2000) Fraser (1994) Freiberg (1999) Creemers
(1994, 1999) and Croll (1996). The extent and the quality of educational resources of school are also among
significance indices which include major and fundamental facilities such as ‘trained’ teachers, suitable class
environment, resources such as suitable equipments, the existence of library, and audio-visual center that can be
effective in the progress of reading literacy. On the other hand, findings of the Creemers and Keeves’s researches
(1973) on the impact of the type of schools in terms of training hours, class density and teachers’ experience show
that schools with experienced, qualified and active teachers are higher in educational performance of students
quoted byRaisDana: 76). The major question is which of the used variables in PRILS study can distinguish high performance schools from low (performance) ones.
2. Materials and Methods

2.1. Target population:

PIRLS study is done as secondary analysis. Statistical population and sample of this study includes selected statistical population and samples in PIRLS in 2006 as follows.

In the first stage all of the schools categorized based on their geographical characteristics (state or province), type of school (public or private), and their locations (urban or rural). Then, 235 schools were chosen among them. In the second stage, one or two classes were chosen randomly based on W3S† software. Regarding the average of the performance of the participant schools in PIRLS study, 78 schools with a /50 standard deviation above the mean (19 school with high performance) and a /5 standard deviation below the mean (59 school with low performance) of all schools in Iran were selected.

†. Within School Sampling Software
2.2. **Measuring tools**

Reading literacy achievement was measured by using a selection of four literary passages drawn from children's storybooks and four informational texts. Submitted and reviewed by the PIRLS countries, the literary passages included realistic stories and traditional tales. The informational texts included chronological and nonchronological articles, a biographical article, and an informational leaflet.

2.2.1. **Progress reading literacy test**

PIRLS study for evaluating the reading literacy performance in two contexts of literary and information uses one booklet included multiple choice questions and constructed response. This test on the whole includes 13 booklets distributed among participating students both randomly and in a rotational way based on W3S software.

2.2.2. **Background questionnaire**

Background questionnaires were administered to collect information about students' home and school experiences in learning to read. A student questionnaire addressed students' attitudes towards reading and their reading habits. In addition, questionnaires were given to students' teachers and school principals to gather information about students' school experiences in developing reading literacy. One of the significant purposes of PIRLS is to study the impact of conditions and characteristics of home-school environment on the progress of reading literacy of children. Therefore, four types of background questionnaires for this purpose have been provided for collecting the desired data, which include the school principal and reading lesson background questionnaires.

With respect to distinguishing factors of high performance schools from low ones and its impact on the reading literacy performance of students, the following variables have been determined for evaluation.

- training duration/training hours
- used resources in teaching of reading
- teacher experience and years of his/her service
- facilities and human resources
- student population
- school environment/climate and behavioural and emotional problems

3. **Data analysis methods**

In order to analyze the distinguishing factors of high and low schools and their impact on the reading literacy performance of students collected data has been analyzed in two levels of descriptive statics (mean and standard deviation) and inferential analysis of logistic regression. The reason of the usage of logistic regression is the continuation of predicate variables and the categorization of criterion variable.

3. 4. **Findings**

<table>
<thead>
<tr>
<th>Variables</th>
<th>High schools</th>
<th>Low schools</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>deviation</td>
</tr>
<tr>
<td>Training time (minutes)</td>
<td>400</td>
<td>121/8</td>
</tr>
</tbody>
</table>
Data in table no.1 shows that there are apparent differences between high performance schools and low schools, such differences can be seen more in variables like teacher’s years of service, student population, and training time. In order to study the impact of variables on distinguishing schools into high and low schools, logistic regression is used. Table of the correlation between the predicate variables is presented before regression table.

**Table no.2 Correlation between predicate variables**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Resource</th>
<th>Density</th>
<th>School environment</th>
<th>Facilities</th>
<th>Time</th>
<th>Years of service</th>
</tr>
</thead>
<tbody>
<tr>
<td>Used resources in teaching reading</td>
<td>1</td>
<td>0/04</td>
<td>0/18</td>
<td>-0/23</td>
<td>0/26</td>
<td>-0/11</td>
</tr>
<tr>
<td>Density of student</td>
<td>0.15</td>
<td>1</td>
<td>0/09</td>
<td>0/27</td>
<td>0/06</td>
<td>0/4</td>
</tr>
<tr>
<td>School environment</td>
<td>0/49</td>
<td>0/22</td>
<td>1</td>
<td>0/27</td>
<td>-0/23</td>
<td>0/02</td>
</tr>
<tr>
<td>Facilities and human resource</td>
<td>-0/18</td>
<td>0/06</td>
<td>-0/16</td>
<td>1</td>
<td>-0/06</td>
<td>0/01</td>
</tr>
<tr>
<td>Training time</td>
<td>0/06</td>
<td>-0/09</td>
<td>-0/10</td>
<td>0/23</td>
<td>1</td>
<td>-0/10</td>
</tr>
<tr>
<td>Teacher’s years of service</td>
<td>0/3</td>
<td>0/01</td>
<td>-0/04</td>
<td>-0/12</td>
<td>0/49</td>
<td>1</td>
</tr>
</tbody>
</table>

**Table no.3 The results of logistic regression analysis**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Regression coefficient</th>
<th>T</th>
<th>Sin</th>
<th>Odds ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>5/82</td>
<td>4/21</td>
<td>1/38</td>
<td>0/171</td>
</tr>
<tr>
<td>Used resources in teaching reading</td>
<td>-0/07</td>
<td>0/05</td>
<td>1/27</td>
<td>0/207</td>
</tr>
<tr>
<td>Density of student</td>
<td>0/09</td>
<td>0/05</td>
<td>-2/06</td>
<td>0/043</td>
</tr>
<tr>
<td>School environment</td>
<td>0/04</td>
<td>0/17</td>
<td>-0/24</td>
<td>0/81</td>
</tr>
<tr>
<td>Facilities and human resource</td>
<td>0/14</td>
<td>0/14</td>
<td>-0/98</td>
<td>0/33</td>
</tr>
<tr>
<td>Training time</td>
<td>0/00</td>
<td>0/01</td>
<td>-0/637</td>
<td>0/536</td>
</tr>
<tr>
<td>Teacher’s years of service</td>
<td>0/08</td>
<td>0/04</td>
<td>-2/02</td>
<td>0/047</td>
</tr>
</tbody>
</table>

Data shows in table no.3. Just two variables as ‘teacher’s years of service’ and ‘density of student’ are significant in explaining the difference of high (performance) and low schools. However, the amount of obtained t is a 0/5 significance which is low. This can happen to some extent because of using Jak naife standard error that uses complicated sampling which causes the standard error to increase more than simple random sampling and as a result the amount of t obtained is less than the corresponding amount of simple random sampling. In addition, using the school's weight is more accurate in estimates.

The proper indices of the model shows the perfect fit of the model, so that the negative log likelihood is 0/172 and the likelihood of Estrella is obtained as 0/199. In addition, the separation of 79/5 of cases in proper class is just another indicator which determines the model fit.

5. Discussion and conclusion

The results obtained from the analysis of data on determining the distinguishing factors of high and low-schools, and their share of each one on the reading literacy performance of students in grade 4 in PIRLS in 2006 shows that among the factors of conditions and environment of school, facilities and human resource training time of school per week, density and the population of students in each class of school and resources of school in reading teaching, two variables of teacher’s years of service and density of students in each class in school have presented a significant relationship with the reading literacy performance.
5.1. Teachers’ years of service variable

The results show that whenever the teachers’ years of service increases, the reading literacy performance of students of that school moves to a higher level. The variable of teachers’ years of service as an important factor in school performance and the role of teachers in using their own educational experience can be effective in teaching quality and increase the efficiency of schools in the teaching-learning process. It is remarkable to note that according to the international findings of TIMS and PIRLS in this matter, though the teachers’ years of educational service are in relation to the educational performance of students, this experience is not only limited to the length of their years in service and their greater experience, it is the quality and the way teachers use their educational background that have crucial roles. Perhaps teachers with long years in service are not as capable in comparison to younger teachers with fewer years of service in terms of professional experience, efficiency, and effectiveness in classroom and due to fatigue and burnout, these teachers are faced with serious problems in classroom.

5.2. Size and the density of reading literacy class variables

Another variable of the role in students' performance of reading literacy was a significant inverse in the relationship between densities of students per class with their reading performance. For instance, where the density of students per class was more, a better performance was noted in contrast to schools with fewer students where their reading literacy performance was visibly lower. The results of TIMSS periodic studies in 1995, 1999, 2003, and 2007 approved the same subject.

These findings are consistent with some conclusion drawn by Herder (1990) and Goldstein, (1998); Hoxby, (2000) regarding the impact of class size and density of student population therein on educational achievement, while the conclusions were inconsistent on other parameters. In this study, there is a significant relationship with the performance of students when the number of students in the class is 15 to 30, and there is no significant relationship in cases where student population in classrooms is below 15 or exceeds 30.

The findings of Slavin, (1989); Toth, (2002) and Hiebert, (1997) on Exploring the Effect of Class Size on Student Achievement Over the Past Two Decades make the researchers, teachers, and educational planners meet new challenges, since these findings indicate that in some countries the increase in the number of students in the classroom is related to the educational achievement of students (Japan, Korea, and Hong Kong), and in some other countries this relationship is reversed (Indonesia, Philippine, Chile, and …). On the other hand, the relationship of density of class has turned into labyrinth from linear relationship in terms of the quality of students’ combination and students’ interaction with their educational achievement. In some countries from a sociological standpoint, individual relationship among students together with the increase of students’ population in the class has positive outcomes, but, only to a certain extent. However, when strained with a further increase, the relationship is reversed. Eventually, what the findings of this research emphasize and can potentially make a right impact on the educational system, and on primary schools in particular is to pay attention to the professional competence, useful experience of teachers, to adopt appropriate polices to maintain experienced and effective teachers on one hand, and to maintain a combination of students and their number in class along with positive and motivating learning environment in schools, on the other hand.

References


Karimi, A. (2003). The report of the results of the high performance Iranian students in comparison to students with low performance in PIRLS in 2001; Research institute for Education; PIRLS office.


