An Exploratory Study of Learning in Schools

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Abstract

Education has continued to evolve, diversify and extend its reach and coverage since the dawn of human history. Every country develops its system of education to express and promote its unique socio-cultural identity and also to meet the challenges of the times. Schools are the backbone of education system where actually the goal of education is fulfilled by interaction among different stakeholders viz. learners, teachers. It is one of the most important facilities and its present status must be known to improve the education system. The aim of the present study is to identify the operational factors affecting learning of a participant in school. An exploratory factor analysis has been conducted on a set of variables identified through literature review and pilot study. This resulted in extraction of five factors namely School Learning Climate, Teacher Willingness, Teacher Competence, School Governance Structure and School Working Climate which affect the learning of a participant in school. Beside this, Student Performance is identified as unique variable representing outcome of learning process.

Key Words: Education, Schools, Learning, Exploratory Factor Analysis, Student Performance.
1. Introduction

Education plays an important role in the progress of an individual’s mind and country. People are made aware of what is going on in the world and can understand these issues and take necessary measures, if they are educated. The right to education has been well recognized by the United Nations General Assembly (UNGA) under Article 26 of Universal Declaration of Human Rights (UNDHR) as:

a. Everyone has the right to education. Education shall be free, at least in elementary and fundamental stages ….

b. Education shall be directed to the full development of human personality and to the strengthening of respect of human rights and fundamental freedoms.

c. Parents have a right to choose the kind of education that shall be given to their children.

India, with more than 1.4 million schools and more than 230 million enrolments, is home to one of the largest and complex school education systems in the world along with China. The government of India has launched an integrated educational programme. ‘The Sarva Shiksha Abhiyan’ (SSA), which is a flagship programme for universalising elementary education and a National mission constituted with the Prime Minister as its Chairman. The programme initially aims to provide eight years of quality elementary education for all children up to the age of 14 years in a mission mode with a thrust on community ownership, disadvantaged groups and quality education for girls.

The Indian education system has made significant progress in recent years. Recognizing the importance of education in national development, the Twelfth Plan (2012–2017) places an unprecedented focus on the expansion of education, on significantly improving the quality of education imparted and on ensuring that educational opportunities are available to all segments of the society. Public spending on education increased rapidly during the Eleventh Plan period. Education expenditure as a percentage of gross domestic product (GDP) rose from 3.3 per cent in 2004–05 to over 4 per cent in 2011–12. Per capita public expenditure on education increased from Rs. 888 in 2004–05 to Rs. 2,985 in 2011–12. The bulk of public spending on education is incurred by the State Governments and their spending grew at a robust rate of 19.6 per cent per year during the Eleventh Plan. Central government spending during the same period increased at 25 per cent per year.

According to the 2009 Right to Education Act, schooling is free and compulsory for all children from the ages of 6 to 14. Elementary education consists of primary (for 6-10 year olds) and upper primary levels (for 11-14 year olds) while secondary education consists of secondary (for 14-16 year olds) and higher/senior secondary levels (for 16-18 year olds).

The Right of Children to Free and Compulsory Education (RTE) Act, 2009 was amended in 2012 and the RTE Amendment Act came into force with effect from 1 August 2012. The
Amendment Act interalia provides for: (i) inclusion of children with disability as contained in the Persons with Disabilities Act 2005 and the National Trust Act under the purview of RTE Act and providing them free and compulsory education, and providing option for home-based education for children with severe disability; (ii) protection of the rights of minorities provided under Article 29 and 30 of the Constitution while implementing the RTE Act; (iii) exemption of Madrasas, Vedic Pathsalas and educational institutions imparting religious instruction from the provisions of the RTE Act.

In all aspects of the school and its surrounding education community, the rights of the whole child, and all children, to survival, protection, development and participation are at the centre. This means that the focus is on learning which strengthens the capacities of children to act progressively on their own behalf through the acquisition of relevant knowledge, useful skills and appropriate attitudes; and which creates for children, and helps them create for themselves and others, places of safety, security and healthy interaction. (Bernard, 1999). The present work makes an attempt to identify the key factors affecting learning of a participant in school and thereby understanding the role in schooling.

2. Contemporary Research on Learning and Quality of Education

School is where we have our first experience of formal learning, and how things go for us here can affect how we learn throughout our lives. When school is exciting and involving, it gives us confidence in ourselves as learners, but when it isn’t, we can be turned off and think we can’t learn or that learning is boring. Each primary school is different, but all aim to give child the opportunity to learn and grow. Primary schools are supported by a strong system that sets state-wide standards in education, but they are also flexible, and can tailor their programs to meet the learning needs of child.

Many definitions of quality in education exist, testifying to the complexity and multifaceted nature of the concept. The terms efficiency, effectiveness, equity and quality have often been used synonymously (Adams, 1993; Bergmann, 1996). Considerable consensus exists around the basic dimensions of quality education today, however. Quality education includes:

- Learners who are healthy, well-nourished and ready to participate and learn, and supported in learning by their families and communities;
- Environments that are healthy, safe, protective and gender-sensitive, and provide adequate resources and facilities;
- Content that is reflected in relevant curricula and materials for the acquisition of basic skills, especially in the areas of literacy, numeracy and skills for life, and knowledge in such areas as gender, health, nutrition, HIV/AIDS prevention and peace;
• Processes through which trained teachers use child-centred teaching approaches in well-managed classrooms and schools and skilful assessment to facilitate learning and reduce disparities;

• Outcomes that encompass knowledge, skills and attitudes, and are linked to national goals for education and positive participation in society.

This definition allows for an understanding of education as a complex system embedded in a political, cultural and economic context. It is important to keep in mind education’s systemic nature, however; these dimensions are interdependent, influencing each other in ways that are sometimes unforeseeable.

It also takes into account the global and international influences that propel the discussion of educational quality (Motala, 2000), while ensuring that national and local educational contexts contribute to definitions of quality in varying countries (Adams, 1993). Establishing a contextualized understanding of quality means including relevant stakeholders. Key stakeholders often hold different views and meanings of educational quality (Motala, 2000; Benoliel, O’Gara & Miske, 1999). Indeed, each of us judges the school system in terms of the final goals we set for our children our community, our country and ourselves (Beeby, 1966).

Physical learning environments or the places in which formal learning occurs, range from relatively modern and well-equipped buildings to open-air gathering places. The quality of school facilities seems to have an indirect effect on learning, an effect that is hard to measure. Some authors argue that extant empirical evidence is inconclusive as to whether the condition of school buildings is related to higher student achievement after taking into account student’s background (Fuller, 1999). A study in India sampled 59 schools and found that of these only 49 had buildings and of these, 25 had a toilet, 20 had electricity, 10 had a school library and four had a television (Carron & Chau, 1996). In this case, the quality of the learning environment was strongly correlated with pupils’ achievement in Hindi and mathematics (Reddy, 2010; Carron & Chau, 1996). In Latin America, a study that included 50,000 students in grades three and four found that children whose schools lacked classroom materials and had an inadequate library were significantly more likely to show lower test scores and higher grade repetition than those whose schools were well equipped (Willms, 2000; ). Other studies, carried out in Botswana, Nigeria and Papua New Guinea, concur with these latter findings (Pennycuick, 1993).

A child’s exposure to curriculum — his or her ‘opportunity to learn’ — significantly influences achievement, and exposure to curriculum comes from being in school (Fuller, 1999). A study of village-based schools in Malawi found that students with higher rates of attendance had greater learning gains and lower rates of repetition, a finding consistent with many other studies (Miske, Dowd et al., 1998).
Educators and researchers from diverse philosophical perspectives have debated the relationship between class size and student learning at length. Although many studies have found a relationship (e.g., Willms, 2000), class size has not consistently been linked to student achievement (Rutter, 1979, cited in Pennycuick, 1993).

Earthman (2002), reporting on California, revealed that comfortable classroom temperature and smaller classes enhance teachers’ effectiveness and provide opportunities for students to receive more individual attention, ask more questions, participate more fully in discussions, reduce discipline problems and perform better than students in schools with substandard buildings by several percentage points.

Well-managed schools and classrooms contribute to educational quality. Students, teachers and administrators should agree upon school and classroom rules and policies, and these should be clear and understandable. Order, constructive discipline and reinforcement of positive behaviour communicate a seriousness of purpose to students (Craig, Kraft & du Plessis, 1998). It is important not to mistake small group cooperative learning for disorder, however; although noise levels may increase, task-orientation and focus on learning signal effective practices.

Effective management of learning infrastructure is the prime responsibility of the school principal and other stakeholders. The administrative responsibility for satisfactory physical environment is not limited to providing new facilities. The school heads should direct the available resources to the maintenance of learning facilities. Existing buildings must be maintained and made functional by providing proper lighting, ventilation and temperature condition for their effective and efficient utilization to ensure good working condition (Olagboye, 2004). Efficient management of school physical facilities is mandatory in order to make the school a pleasant, safe and comfortable centre that will increase students’ attendance motivation and willingness to participate adequately in both curricula and co-curricular activities (Adeboyeye, 2000; Sikdar, 2012).

Whether a teacher uses traditional or more current methods of instruction, efficient use of school time has a significant impact on student learning. Teachers’ presence in the classroom represents the starting point. Many teachers face transportation and housing obstacles that hinder them from getting to school on time and staying until school hours are over. Many teachers must hold second jobs, which may detract from the time and energy they expend in the classroom. Teachers may miss school altogether. A study in China, Guinea, India and Mexico found that nearly half the teachers interviewed reported being absent at some point during the previous month (Carron & Chau, 1996), requiring other teachers to compensate for them or leaving students without instruction for the day.

Next, when teachers are present, learning occurs when teachers engage students in instructional activities, rather than attending to administrative or other non-instructional
processes (Fuller, 1999). As mentioned above, the opportunity to learn and the time on task have been shown in many international studies to be critical for educational quality. Finally, some schools that have been able to organize their schedules according to children’s work and family obligations have seen greater success in student persistence and achievement. In Ethiopia, for example, schools that began and ended the day earlier than usual and that scheduled breaks during harvest times found that educational quality improved. “The quality of a school and the quality of teaching of the individual teacher is higher in schools that are able (and willing) to make more efficient use of the available time of its teachers and its pupils” (Verwimp, 1999). The present study contributes to the existing literature by identifying factors affecting learning in a school based on empirical research.

3. Methodology

3.1 Selection of Population and Sample

The population frame for the study included all primary and upper primary schools of Meghalaya state in India. There are 6612 such schools in Meghalaya comprising governments, private aided, private un-aided, and others. However, primary data have been collected from 75 schools for carrying the study.

3.2 Data Collection

The study utilized a multiple research design including preliminary interviews, questionnaire surveys, and expert opinions from students, teachers and principals. A survey questionnaire incorporating nineteen variables that may affect the learning of a participant is constructed, which helped to meet the research objectives addressed in this report. The questionnaire has been made simple and easy to understand. A brief outline of the background and objective of the study precedes the set of questions. Each question expresses the degree of influence of each variable on the learning of a participant. It is a closed-ended questionnaire based on seven point Likert scale. From the above mentioned 75 schools, two hundred (200) respondents (teachers, principal) are selected and the questionnaires have been administered to them both through face to face interview after taking prior appointments and by sending the questionnaires through mails and through telephonic interviews. The survey responses have been collected between January 2016 and March 2016. Finally a total of 169 questionnaires contained complete filled-in information are used for data analysis.

3.3 Work Plan

The present work has two distinct phases. In the first phase, study has been initiated for identifying a list of possible variables that may affect the learning of a participant in the schools from secondary sources. The outcome of the survey of existing literature has identified fifteen such variables. Further, unstructured interviews and interactions with school professionals have resulted in enlargement of the initial database on learnings. Consequently,
a list of nineteen variables has been created, which are supposed to influence the learning of a participant in the schools.

The second phase of the study starts with the data collection on the degree of influence of each of the nineteen identified variables on the learning of a participant in school by questionnaire survey. The data have further been used to construct a correlation matrix, which shows high correlations amongst some of the variables. An exploratory factor analysis has been conducted to reduce the original set of variables to a smaller manageable set of factors which are meaningful representations of these variables.

4. Analysis and Discussion

In this section, attempt has been made to select the factors which collectively affect the learning of a participant. The first phase of the study is initiated by creating a list of possible variables identified from secondary sources as well as by conducting unstructured interviews with school professionals. An exploratory factor analysis is conducted on the identified learning variables to compress the list of variables to a small manageable set of factors. This section incorporates a description of the learning variables which are expected to affect the learning of a participant in School and also discusses the results and interpretation of the exploratory factor analysis conducted on these variables.

4.1 Variables Affecting Learning

The first phase of the study is initiated by creating a list of possible variables affecting learning of a participant in school from secondary sources. Survey of existing literatures result in getting fourteen number of such variables. Unstructured interviews and interactions with school professionals helped the author to enlarge the initial database of indicators and to arrive at a set of nineteen (19) learning variables in school. The detailed description of the variables are presented below:

1. **Intake Student Quality (ISQ):** Quality of incoming student (i.e. student taking admission in that school).
2. **School Discipline (SD):** Status of discipline maintained and measures to ensure discipline.
3. **Student Performance (SP):** Students performance in comprehensive continuous evaluation.
4. **Infrastructure Availability (IA):** Availability of buildings, playground, adequate classrooms, laboratory, separate washrooms for girls and boys etc.
5. **School Management Committee Involvement (SMCI):** Involvement of school management committee in day to day affairs and to ensure quality of education.
6. **Teacher Educational Qualification (TEQ):** Level of education attained by school teachers.
7. **Personnel (Teacher & Staff) Attendance (PA):** Level of attendance maintained by teacher, staff and principal of school.

8. **Principal Qualification (PQ):** Level of education attained by principal of school.

9. **Student Attendance (SA):** Level of attendance maintained by student.

10. **Management Interference (MI):** Interference by top management in terms of taking out teachers from school for other purposes like election duty, census etc.

11. **Pedagogy (PED):** Teaching methodology followed in school. Measured in terms of whether it is light (i.e. fun and as per interest of student) or heavy (i.e. too much homework, memorization etc.)

12. **Teacher’s Involvement (TI):** Involvement of teachers in day to day affairs as well as in students learning process.

13. **Teacher Work Experience (TWE):** Number of year of service particularly in teaching.

14. **Ambience of school (AS):** School ambience in terms of cleanliness, layout, laboratory and library arrangement.

15. **Teaching Facilities Availability (TFA):** Availability of teaching learning material, computers, video conferencing, smart classes etc.

16. **Ownership of School (OS):** School ownership in terms of government, private, government aided etc.

17. **Distance of School (DS):** Distance of school from student’s home as well as teacher’s and staff’s home.

18. **Safety Concern (SC):** Parents concern regarding safety of children in school particularly for girl child.

19. **Teacher Student Ratio (TSR):** Number of student per teacher.

For the analysis purpose all of the above identified variables along with notation and symbol are presented in table 1.

### 4.2 Development of Survey Instrument

A survey questionnaire is constructed incorporating nineteen variables as discussed in previous section for assessing the influence of each variable on learning of a participant in school. The questionnaire has been made simple and easy to understand. A brief outline of the background and objective of the study precedes the set of questions. Each question expresses the degree of influence of each variable on the learning of a participant in school. It is a closed-ended questionnaire based on seven point Likert scale.

### 4.3 Conceptual Framework for the Analysis

Once the responses are received, the scale reliability of the variables is tested through Cronbach’s alpha value. It is found to be 0.7439, which is well above the conventional reliability criterion of 0.7. A correlation coefficient matrix is constructed for all the above mentioned nineteen variables using the SYSTAT software. The data used for the coefficient...
matrix is obtained from the responses of the filled in questionnaire. It is observed that there exists high correlation among few sets of variables. This motivates us to conduct Factor Analysis and find out the group of variables representing a single underlying construct, or factor, which is responsible for the observed correlations.

An exploratory factor analysis is conducted on these 19 variables in order to identify the key factors influencing the learning of a participant in school. Factor analysis is a statistical tool to determine a minimum number of unobservable common factors by studying the covariance among a set of observed variables (Malhotra, 2001). It is a data reduction procedure that identifies the underlying relationships that exist within a set of variables. The essential purpose of factor analysis is to describe, if possible, the covariance relationships among many variables in terms of a few core, but unobservable, random quantities called latent variables or factors. A factor is an underlying quality found to be characteristics of the variables. Common factors have effects shared in common with more than one observed variable. Unique factors have effects that are unique to a specific variable.

For conducting factor analysis there should be at least four or five times as many observations (sample size) as there are variables (Basilevsky, 1994). In this study 169 observations has been collected, which is more than 5 times of the 19 explanatory variables. The steps that have been followed in conducting the factor analysis are (a) to determine the method of factor analysis, (b) to rotate the factors, and (c) to extract and interpret the factors.

4.3.1 Method of Factor Analysis

The approach used to derive the weights or factor score coefficients differentiates the various methods of factor analysis. The two basic approaches available for factor analysis are Principal Components Analysis (PCA) and Common Factor Analysis (CFA).

4.3.2 Rotation of the Factors

The method of PCA is used in this study to determine the minimum number of factors that will account for the maximum variance in the collected data, which will be used in subsequent multivariate analysis. These factors are called principal components.

After conducting PCA, a factor matrix called the factor pattern matrix is obtained. This factor matrix contains the coefficients used to express the standardized variables in terms of the factors. These coefficients, known as factor loadings, represent the correlations between the factors and the variables. A coefficient with a large absolute value indicates that the factor and the variables are closely related. Although the initial or unrotated factor matrix indicates the relationship between the factors and individual variables, but it does not provide results that can be interpreted, because the factors are correlated with many variables. In order to increase that interpretability of the factors, the factor matrix is rotated. In a Cartesian coordinate system where axes are the factors and points are the variables, factor rotation is the process of holding the point’s constant and rotating the factor axes. The rotation is done in a
manner so that the points are highly correlated with the axes and provide a more meaningful interpretation of the factor solution. The rotation is called orthogonal if the axes are maintained at right angles.

Varimax rotation is employed in this study. Varimax rotation is an orthogonal rotation of factors that redistributes the variance accounted within the pattern of factor loadings. It has been observed that both the communalities and the total variance accounted for have been found same before and after rotation. The procedure is the most commonly used to re-orient or clean up the loadings obtained in a principal components analysis.

4.3.3 Extraction and Interpretation of Factors

It is possible to compute as many principal components as there are variables, but in doing so, no parsimony is gained. In order to summarize the information contained in the original variables, a smaller number of factors need to be extracted. To decide how many factors are needed to represent the overall variables, eigen values have been estimated. Eigen value of the factor represents the total variance explained by that factor. The minimum number of factors is extracted by using the commonly used Kaiser rule of thumb; i.e. the initial eigen value should be greater than or equal to one. A scree plot has also been used to determine the number of factors. A scree plot is the plot of the eigen values against the number of factors in order of extraction. The shape of the plot is used to determine the number of factors.

The plot has a distinct break between the steep slope of factors, with large eigen values and a gradual trailing off associated with the rest of the factors. This gradual trailing off is referred to as the scree. Evidence indicates that the point at which the scree begins denotes the true number of factors. After determination of the factors, their interpretation is done by identifying the variables that have large loadings on the same factor.

4.4 Results and Discussion

4.4.1 Results of Principal Component Analysis (PCA)

Factor analysis is conducted with the twenty nine identified variables, using the method of Principal Component Analysis (PCA). The analysis has been carried out using the statistical software package, SPSS. A factor structure coefficient matrix is obtained through this analysis. The coefficients of the matrix refer to the correlation between factors and variables and known as factor loading. The varimax rotation method is applied to enhance the interpretability of the factors by minimizing the number of variables that have high loadings on a factor. The varimax-rotated factor-loading matrix is presented in Table 2. Using the eigen value criteria, five factors have been extracted whose eigen value is greater than one. These five factors are also identified from the scree plot, as shown in figure 1.
### Table 1: Variables, Notation and Symbol

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Notation</th>
<th>Symbol</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intake Student Quality</td>
<td>ISQ</td>
<td>V1</td>
<td>Preliminary study</td>
</tr>
<tr>
<td>Teacher Educational Qualification</td>
<td>TEQ</td>
<td>V6</td>
<td>Preliminary study</td>
</tr>
<tr>
<td>Principal Qualification</td>
<td>PQ</td>
<td>V8</td>
<td>Sida (2000)</td>
</tr>
<tr>
<td>Student Attendance</td>
<td>SA</td>
<td>V9</td>
<td>Miske, Dowd et al. (1998)</td>
</tr>
<tr>
<td>Management Interference</td>
<td>MI</td>
<td>V10</td>
<td>Preliminary study</td>
</tr>
<tr>
<td>Pedagogy</td>
<td>PED</td>
<td>V11</td>
<td>S. Satadru and Mukherjee Anit N., (2012)</td>
</tr>
<tr>
<td>Teacher’s Involvement</td>
<td>TI</td>
<td>V12</td>
<td>Ellison, L., and Rothenberger, B. (1999)</td>
</tr>
<tr>
<td>Teacher Work Experience</td>
<td>TWE</td>
<td>V13</td>
<td>Sida (2000)</td>
</tr>
<tr>
<td>Ambience of school</td>
<td>AS</td>
<td>V14</td>
<td>Earthman (2002)</td>
</tr>
<tr>
<td>Ownership of School</td>
<td>OS</td>
<td>V16</td>
<td>Fuller, (1999)</td>
</tr>
<tr>
<td>Distance of School</td>
<td>DS</td>
<td>V17</td>
<td>Basumatory Rupon (2012)</td>
</tr>
<tr>
<td>Safety Concern</td>
<td>SC</td>
<td>V18</td>
<td>Shamus P. O'Meara (2013)</td>
</tr>
<tr>
<td>Teacher Student Ratio</td>
<td>TSR</td>
<td>V19</td>
<td>Olagboye (2004)</td>
</tr>
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</table>

### Table 2: Varimax Rotated Factor Loading Matrix

<table>
<thead>
<tr>
<th></th>
<th>Factor 1</th>
<th>Factor 2</th>
<th>Factor 3</th>
<th>Factor 4</th>
<th>Factor 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISQ</td>
<td>0.079</td>
<td>0.181</td>
<td><strong>0.859</strong></td>
<td>-0.091</td>
<td>0.105</td>
</tr>
<tr>
<td>SD</td>
<td>-0.073</td>
<td>-0.073</td>
<td><strong>0.969</strong></td>
<td>0.085</td>
<td>-0.207</td>
</tr>
<tr>
<td>SP</td>
<td>0.383</td>
<td>-0.077</td>
<td>-0.593</td>
<td>0.18</td>
<td>0.583</td>
</tr>
<tr>
<td>IA</td>
<td>0.737</td>
<td>0.206</td>
<td>0.586</td>
<td>-0.042</td>
<td>-0.019</td>
</tr>
<tr>
<td>SMCI</td>
<td>0.406</td>
<td>-0.291</td>
<td>0.422</td>
<td>0.399</td>
<td><strong>0.64</strong></td>
</tr>
<tr>
<td>TEQ</td>
<td>-0.492</td>
<td>0.325</td>
<td>-0.32</td>
<td><strong>0.739</strong></td>
<td>0.049</td>
</tr>
<tr>
<td>PA</td>
<td>-0.194</td>
<td><strong>0.883</strong></td>
<td>-0.153</td>
<td>0.167</td>
<td>-0.287</td>
</tr>
<tr>
<td>PQ</td>
<td>0.013</td>
<td>0.012</td>
<td>0.073</td>
<td><strong>0.985</strong></td>
<td>-0.092</td>
</tr>
<tr>
<td>SA</td>
<td><strong>0.885</strong></td>
<td>-0.176</td>
<td>-0.205</td>
<td>0.333</td>
<td>0.171</td>
</tr>
<tr>
<td>MI</td>
<td>0.255</td>
<td><strong>-0.76</strong></td>
<td>0.248</td>
<td>0.48</td>
<td>0.24</td>
</tr>
<tr>
<td>PED</td>
<td>-0.189</td>
<td><strong>-0.927</strong></td>
<td>-0.202</td>
<td>-0.056</td>
<td>-0.209</td>
</tr>
<tr>
<td>TI</td>
<td>0.189</td>
<td><strong>0.927</strong></td>
<td>0.202</td>
<td>0.056</td>
<td>0.209</td>
</tr>
<tr>
<td>TWE</td>
<td><strong>0.838</strong></td>
<td>0.002</td>
<td>-0.292</td>
<td>-0.375</td>
<td>-0.238</td>
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<tr>
<td>AS</td>
<td><strong>0.713</strong></td>
<td>0.226</td>
<td>0.598</td>
<td>-0.084</td>
<td>0.274</td>
</tr>
<tr>
<td>TFA</td>
<td><strong>0.808</strong></td>
<td>0.341</td>
<td>0.269</td>
<td>-0.22</td>
<td>0.236</td>
</tr>
</tbody>
</table>
Table 3: Variance Explained by Each Factor

<table>
<thead>
<tr>
<th></th>
<th>Factor 1</th>
<th>Factor 2</th>
<th>Factor 3</th>
<th>Factor 4</th>
<th>Factor 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variance Explained by Rotated Components</td>
<td>6.017</td>
<td>3.86</td>
<td>3.887</td>
<td>2.55</td>
<td>2.021</td>
</tr>
<tr>
<td>% variance explained</td>
<td>31.666</td>
<td>20.315</td>
<td>20.458</td>
<td>13.422</td>
<td>10.637</td>
</tr>
<tr>
<td>Cumulative %</td>
<td>31.667</td>
<td>51.981</td>
<td>72.439</td>
<td>85.439</td>
<td>96.076</td>
</tr>
</tbody>
</table>

It can be observed from the factor loading matrix that the five factor model explains 96% of the total sample variance in the data as presented in Table 3. Further, it can also be observed that there is a wide range of variation in the proportion being explained by each factor. First factor explains 31.666 percent of variance, while fourth and factor explains only 13.422 and 10.637 percent variance respectively.

Figure 1: Scree Plot Showing the Eigen Values

4.4.2 Interpretation of Factors

The five factors that are extracted from the varimax rotated factor matrix are analyzed and interpreted on the basis of their factor loadings. Those variables which have a loading of more than 0.63 i.e. 40 percent overlap in variance between the variable and the factor, are included in a particular factor. As a rule of thumb, a loading of more than 0.71 (50 percent overlap) is considered as excellent, 0.63 (40 percent) as very good, 0.55 (30 percent) as good, 0.45 (20 percent) as fair, and less than 0.45 as poor.
percent) as fair, and below 0.32 (less than 10 percent of overlap) as poor (Bhaduri, 2002). In this study 0.63 is used as the cutoff for interpretation. Thus, the results so obtained are considered to be fairly robust.

**Factor 1** includes the variables like infrastructure availability, student attendance, and teachers work experience, ambience of school, teaching facilities availability, and teacher student ratio and safety concern. This factor represents the learning climate of school. The factor has a positive loading on infrastructure availability, student attendance, teachers work experience, ambience of school, and teaching facilities availability and negative loading on teacher student ratio and safety concern. The positive loading pattern explains that for a good learning climate school needs better infrastructure, regular attendance by students, and teacher with a high teaching experience, better teaching facilities with good ambience. While, the negative loading suggests that lower the teacher student ratio and safety concern by parents better will be learning environment. Thus, this factor can be recognized as **School Learning Climate**.

**Factor 2** consists of variables like personnel (teacher & staff) attendance, management interference, pedagogy and teacher’s involvement. This factor is negatively loaded in favor of two variables, i.e. management interference and pedagogy and has a positive loading with personnel (teacher & staff) attendance and teacher’s involvement. The loading pattern indicates that lower management interference in day to day affair will contribute in more willingness in imparting skill and knowledge by teachers. Again, a willing teacher will introduce a pedagogy as per the interest of students and therefore, it will be fun and learning at the same time for participants. The positive loading suggest that a willing teacher is more likely to come school regularly as well as will be more involved in day to day affair of institute and learning process of students. Thus, this factor can be recognized as **Teacher Willingness**.

**Factor 3** includes variables like intake student quality, school discipline and distance of school. This factor has positive loading with intake student quality and school discipline. The positive loading pattern indicates that a school with good student quality and better discipline will have better work climate. The negative loading with distance of school suggest a school far from student and teacher’s home is not an ideal school for student as well as teacher. Hence, this factor can be identified as **School Work Climate**.

**Factor 4** comprises of teacher educational qualification and principal educational qualification. This factor has positive loading with both variables. The positive loading indicates that higher qualification of teachers and principal give rise to more competent teacher in school. Hence, this factor can be identified as **Teacher Competence**.

**Factor 5** includes school management committee involvement and ownership of school. This factor is positively loaded with both variables. Positive loading with school management
committee involvement indicates that a better governed school will have more involvement from management. Also, governance pattern depends upon the ownership pattern of school. Thus, this variable can be termed as School Governance Structure.

It can also be observed that one of the variable used in factor analysis, student performance is not incorporated in any of the factors affecting learning of a participant in school. This result suggests that this variable is are not very important in explaining the learning of a participant in school. This variable need to be studied separately. From the description of variable student performance also it is clear that student performance is outcome of learning process in a school.

5. Conclusions and Recommendations

This study is an initial attempt to identify the key factors affecting learning of a participant in a school. The factor analysis identifies a set of five key factors namely School Learning Climate, Teacher Willingness, Teacher Competence, School Governance Structure and School Working Climate. The detailed description on interpretation of these factors is presented in Section 4. Outcome of this part of research is expected to help academicians and practitioners to have a multidimensional perspective in understanding and conceptualizing the functioning of the school. Usually, researchers working on school education consider a single dimension approach by focusing either on school discipline or student performance.

The factor analysis presented an interesting observation that one of the variables, student performance is not incorporated in any of the factors affecting learning. This suggests that student performance is independent issue in learning of a participant in school education. From an operations point of view also student performance is an outcome of learning process. Student performance may rather provide feedback to the system regarding efficiency and effectiveness of process than affecting learning itself.

If one consider school as an operating system then in the identified factor School Governance Structure, Teacher Competence and School Work Climate may be regarded as input of the operating system along with student. School Learning Climate and Teacher Willingness help in transforming a participant, and therefore, transformation process of operating system. In this case, student performance will represent the outcome of operating system. Thus, to improve the learning in school one need to consider the ways to improve school learning climate and teacher willingness. This is one of the area that provide a good scope of further research.

The study outcomes carry important implications for effective and efficient management of Indian school education. The stakeholders of schools and the national policy makers of the school education are expected to get benefit from the major findings of this research paper. In order to cope up with the challenges and opportunities emerging from the growing market
with intensified demands, technology growth and market competition, Indian school education sector is expected to undergo sea change in its structure, policy and overall management. With implementation of Sarv Siksha Aviyan (SSA), Mid Day Meal (MDM) and Right to Education, schools are able to improve the student attendance but still the quality of education is poor. To improve the quality of education one of the most important dimension that this paper come up with is school learning climate. Therefore, policy makers must identify and implement the ways to improve the same.

References


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