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Building as Learning Aid Interventions and Learning Outcomes of Grade-III Primary School Students

*Dr. Kanwalpreet Kaur

Assistant Professor, Institute of Educational Technology & Vocational Education, Panjab University, Chandigarh (India)

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***Corresponding Author**
Email: sherrysidhu[at]rediffmail.com

ABSTRACT

The present study aimed to explore the impact of Building as Learning Aid (BaLA) interventions developed in the schools of Chandigarh (U.T.) on the learning outcomes of grade-III students studying in primary schools of Chandigarh (U.T.). The study was conducted on a sample of 4047 students of grade-III studying in primary schools of Chandigarh. The selected students were tested on four defined learning parameters related to various concepts of BaLA. The results on the parameter of interacting with Hindi language; understanding the physical world around us; and knowledge of the natural environment pointed out that BaLA initiatives have an affirmative impact on the learning outcomes of grade-III students. The results of study indicated that BaLA interventions has led to enhance learning outcomes of grade-III primary school students.

1. Introduction

The Right to Free and Compulsory Education Act 2009 came into effect on 1st April, 2010 and it provides a justifiable legal framework that entitles all children between the ages of 6-14 years free and compulsory admission, attendance and completion of elementary education. It provides for children's right to an education of equitable quality, based on principles of equity and non-discrimination. Most importantly, it provides for children's right to an education that is free from fear, stress and anxiety (MHRD, 2016).

The Government of India spending huge amount of money on the schools for the improvement of Education. India is having 13, 60,000 elementary schools (up to grade VIII) and 19.7 crore children study in these schools. The 87% of these schools are in rural areas and 13% are in the urban areas. Till date many studies have been carried out to evaluate the outcomes of different government funded programs such as SSA, RTE, Midday meal etc. on the improvement of elementary education in India. These studies have clearly shown that India has made significant progress in access to schooling and enrollment rates in primary education but dropout rates and low levels of learning remain challenge for the state and central government.

To improve the learning levels of primary school students, state governments took plenty of initiatives in the form of learning enhancement programmes. In this regard, the Government of India in 2006, initiated a scheme called 'BaLA' i.e. Building as Learning Aid to develop the school architect and infrastructure as a learning support system. So, that students can learn by interacting with the physical environment of their schools during structured or unstructured time, consciously or unconsciously environment and they got multisensory experiences.

The concept of BaLA was originally developed by Vinyas, Centre for Architectural Research & Design with support from UNICEF. In 2007, Centre for Architectural Research & Design with support from UNICEF developed a manual with photographs and details to understand, plan and implement BaLA in schools of Delhi. A comprehensive colourful document was published which has also reached several parts of India. It is now implemented across the country in all districts, since 2006. BaLA was conceived under the project 'Creating Teaching-Learning Aids and Experiences in the Primary School Built Environment'.

BaLA is about developing the school's entire physical environment as a learning aid – the inside, the outside, the semi-open spaces – everywhere. At the core, it is about maximizing the educational 'value' of a built space. It is based on 'how children learn'. BaLA is a tool to promote learning, curiosity, care and concern, wonder and lifelong learning. It helps children to practice and revisit concepts. It also helps learning to take place everywhere - in the classroom, the corridor, the varandas, the outdoors, etc. (Vinyas and UNICEF, 2012).

Since 2006, BaLA has reached out to more than one lakh schools in India situated in 19 states and Union Territories of India. BaLA can act as an intervention to achieve the goals of elementary education in India by providing equity and quality in education to the students (Vajpeyi and TEDx, 2016).

Making education more practically relevant is a priority of the nation. Therefore, the schools should also help in propagating creativity as creativity now is as important in education as literacy, and we should treat it with the same status. Vajpeyi (2010) reported following findings shared by the teachers and principals from various schools across the country, where BaLA has been implemented:

- There is increase in enrolment and retention of children.
- Very often, the children come to school much before school hours and leave much after school hours.
- Learning has become more interesting for the children and the teacher.

- Abstract notions are better understood through concrete examples.
- Children and teachers have become more aware and ask more questions in schools.
- Distance between children and teachers has melted down.
- There is decrease in vandalism and negative behaviour of children in schools.
- A more holistic approach to develop schools has taken place with better communication between teachers and engineers.
- Village education committees have become more excited and contributed efforts and money for BaLA intervention.
- Parents have moved children from private schools to government school under SarvaSikshaAbhiyan (SSA).

The environment plays a critical role in learning, the richer the environment the more concrete opportunities there are for learners to learn by interacting with instructional material. A number of studies have shown that quality of physical environment broadly correlates with students' attendance, behaviour and achievement (Woolner et al., 2007; and Duran-Narucki, 2008).

According to Department of School Education, Chandigarh Administration (2016) the BaLA concept (for making the learning a joyful experience) was implemented in 73 government schools out of total 115 government schools, at primary level till 2012-13. The present study is an effort to evaluate the impact of BaLA on learning outcomes of primary school students.

2. Research Questions

The research questions for the present study are as follows:

- Do BaLA interventions have an effect on the learning outcomes of primary school students?
- Is there any significant difference in learning outcomes of male and female students of grade-III with respect to BaLA interventions?
- Is there any significant difference in learning outcomes of students of grade-III studying in rural and urban schools with respect to BaLA interventions?

3. Method and Procedure

3.1 Method of study: The present study was an exploratory study wherein descriptive survey method used to collect data regarding learning outcomes of primary school students and examine whether BaLA interventions could possibly have an effect on the learning outcomes of primary school students.

3.2 Sample of study: For the study, a sample of 50 schools of Chandigarh (U.T.) was purposively selected which have well developed BaLA concepts in their school premises. For the study, 4047 students of grade-III were the final sample that includes only those who participated and responded on the response sheets. The details of the selected sample are as follows:

Table1. Details of selected Sample of Grade-III Primary School Students

Grade - III (Total =4047)			
Boys	Girls	Rural	Urban
2048	1999	2842	1205

3.3 Tools and procedure of data collection: An achievement test was developed and validated for grade-III primary school students on the themes of BaLA developed in the schools of Chandigarh. The items of achievement test were developed on the four learning parameters as prescribed by VINYAS & UNICEF (2012) i.e.

- **Parameter-1- Ways of interacting with Language:** It is tested at two levels i.e. written expressions in regional/ Hindi language and written expressions in English language.
  - **Parameter-1A-** Written expressions in Hindi Language: To examine the written expressions in Hindi Language, four items related to identifying shapes and concept of directions of sun rise and sun set were framed.
  - **Parameter-1B-** Written expressions in English Language: To examine the written expressions in English Language, eight items related to identify pictures of different objects were framed to test the written expressions of students in English language.
- **Parameter-2- Dealing with complexity of Numbers and Geometry:** To assess the ability of students to deal with Numbers and Geometry, twenty-four items related to complexity of numbers and geometry, tables, roman numbers, clock timings, basic arithmetic operations, measurements and two-dimensional geometric shapes were framed.
- **Parameter-3- Understanding the Physical World around us:** To evaluate the knowledge of students about the physical world around us, twelve items related to colours of traffic lights, modes of transport, sports activities, Indian festivals, communication instruments and national symbols were framed.
- **Parameter-4- Knowledge of the Natural Environment:** To judge the understanding of students about natural environment twelve items related to parts of human body and parts of plant were framed.

Items on defined parameters were developed with the help of experienced primary school teachers and teacher educators. First draft contained sixty-six items. A review of developed items by two experts is done and a pre-try out of first draft was conducted on a sample of 100 students of grade-IV (who have not participated in the study) to validate the test items.On the basis of suggestions of experts and pre-try out results, six items were dropped and seven items were modified. Final draft of test contained sixty items and the time limit to complete the test was ninety minutes. Thedata on achievement test was collected from the students of grade-III with the active support of cluster resource coordinators, teachers and principals of the schools during the period of January 9, 2017 to February 7, 2017.

4. Results and Findings

For analysing the data on achievement test, percentage analysis was done to summarise learning outcomes of Grade-III students. On the basis of percentage of achievement scores, the students are segregated into five categories i.e. students getting less than 1% score; scores between 1% to 25%; scores between 26% to 50%; scores between 51% to 75%; and scores between 76% to 100%. As difference between the upper limit of an interval and lower limit of next interval is one, so 0.5 is deducted and added from lower limit and upper limit of every interval and achievement scores are put up in the intervals by using this proposition and the results are summarised as follows:

5.1. Analysis of Learning Outcomes of Grade - III Students: A percentage analysis of learning outcomes of grade - III students on various BaLA parameters is presented as follows:

Table 2. Percentage Analysis of Learning Outcomes of Grade - III Students

Learning Parameters	Percentage of students having scores				
	Less than 1%	1% to 25%	26% to 50%	51% to 75%	76% to 100%
Parameter-1A: Ways of interacting with language- : Written Expressions in Hindi language	2.09%	10.25%	23.19%	38.91%	25.54%
Parameter-1B: Ways of interacting with language - : Written Expressions in English language	13.53%	20.63%	26.27%	27.23%	12.30%
Parameter-2: Dealing with complexity of Numbers and Geometry	7.83%	20.73%	29.42%	26.84%	15.16%
Parameter-3: Understanding the Physical World around us	4.14%	12.64%	21.89%	28.16%	32.78%
Parameter-4: Knowledge of the Natural Environment	6.43%	9.58%	15.09%	35.36%	33.51%
Overall Score	6.80%	14.76%	23.17%	31.3%	23.86%

Table 2 summarises results of grade-III on overall achievement test and its various parameters. The overall score of students of grade-III clearly shows that 6.80% scored less than 1% score; 14.76% scored between 1% - 25%; 23.17% scored between 26% - 50%; 31.3% scored between 51% - 75%; and 23.86% scored between 75%-100%. The achievement of students' on various parameters is presented as follows:

- **On Parameter-1A- Ways of interacting with Language:** Results indicated that 2.09% students of grade-III cannot write in Hindi language correctly as they have scored less than 1%; 10.25% scored between 1%-25%; 23.19% scored between 26% - 50%; 38.91% scored between 51% - 75%; and 25.54% scored between 75%-100%.
- **On Parameter-1B- Ways of interacting with Language:** Results indicated that 13.53% students of grade-III were not able to write and use English Language correctly as they have scored less than 1%; 20.63% scored between 1% - 25%; 26.27% scored between 26% - 50%; 27.23% scored between 51% - 75%; and 12.30% scored between 75%-100%.
- **On Parameter-2- Dealing with Complexity of Numbers and Geometry:** Results of students on achievement test clearly showed that 7.83% students of grade-III were not able to solve any problem related to numbers and geometry as they have scored less than 1%; 20.73% scored between 1% - 25%; 29.42% scored between 26% - 50%; 26.84% scored between 51% - 75%; and 15.16% scored between 75%-100%.
- **On Parameter-3 -Understanding the Physical World around us:** Results of students on achievement test clearly indicated that only 4.14% students of grade-III were not able to identify the physical things around us correctly as they have scored less than 1%; 12.64% scored between 1% - 25%; 21.89% scored between 26% - 50%; 28.16% scored between 51% - 75%; and 32.78% scored between 75%-100%.
- **On Parameter-4 -Knowledge of the Natural Environment:** Results clearly showed that 6.43% students of grade-III were not having any knowledge regarding natural environment as they have scored less than 1%; 9.58% scored between 1% - 25%; 15.09% scored between 26% - 50%; 35.36% scored between 51% - 75%; and 33.51% scored between 75%-100%.

5.2. Comparison of Learning Outcomes of Grade - III Students: To compare learning outcomes of male and female students; and students enrolled in rural and urban schools, t-ratio for significance of difference between means of achievement scores was computed and results are summarised as follows:

Table 3: t-ratio between Mean Achievement Scores of Male - Female and Students enrolled in Rural and Urban Primary Schools

Category of Students	N	Mean	S.D.	t-ratio
Male	2048	21.39	5.39	0.77
Female	1999	21.52	5.24	
Rural School	1205	21.27	4.38	2.19*
Urban School	2842	21.63	4.93	

**Significant at 0.05 level of significance*

From table 3, it is evident that no significant difference was found in learning outcomes of male and female students of grade-III. However female students of grade-III scored more on mean achievement scores than their male counterparts. But, a significant difference in learning outcomes of grade-III students of rural and urban schools was found at 0.05 level of significance. The urban students of grade –III scored more on mean achievement scores than their rural counterparts.

5. Discussion and Conclusions

The present study was conducted to explore the impact of BaLA interventions on learning outcomes of grade-III students studying in primary schools of Chandigarh (U.T.). The results of the study clearly indicated that overall learning outcomes of grade-III primary school students were above average, as 55.16% students scored more than 50% score on achievement test based on BaLA interventions.

On the first parameter i.e. ways of interacting in Hindi language, 64.45% students of grade-III scored more than 50% score, it indicates that majority of students were proficient in writing in Hindi language correctly. But on the second part of first parameter i.e. ways of interacting in English language, only 39.53% students scored more than 50% score.

On the second parameter i.e. dealing with complexity of numbers and geometry, only 42% students scored more than 50% score, it specifies the need to strengthen the skills of students to deal with numbers and geometry.

On the third parameter i.e. understanding the physical world around us, 60.94% students scored more than 50% score, which shows that students were quite aware about the physical world around them and they observe carefully the processes and events occurring around them.

On the fourth parameter i.e. knowledge of the natural environment, 68.87% students scored more than 50% score, it indicates that students have good knowledge about the natural environment and its components.

During visits to schools for data collection, it's noticed that students were taking keen interest in observing various BaLA concepts during recess, free period, play time and while passing through corridors. Majority of students were found noticing alphabets, words, diagrams, pictures, time clocks, identifying the objects, shapes, directions, signs and symbols. During recess or play period, students were found playing games related to BaLA concepts.

The all India (rural) figures as per ASER (2014) and ASER (2016), for reading levels, level of arithmetic, and ability to read English pointed out that the proportion of standard III who are able to read at least standard I level text in first language has gone up slightly, from 40.2% in 2014 to 42.5% in 2016.In 2014, for the country 25.4% of standard III children could do a 2-digit subtraction and this number has risen slightly to 27.7% in 2016.In 2016, 32% children in standard III could read simple words in English as compared to 28.5% in 2009.As compared to all India (rural) figures of ASER (2014 and 2016), the results of the present study are quite encouraging and it shows that BaLA interventions have a positive impact on learning outcomes of students on all the parameters.

The results pointed out that BaLA initiatives have an affirmative impact on the learning outcomes of students on the parameters of interacting with Hindi language; understanding the physical world around us; and knowledge of the natural environment. Vajpeyi (2010) concluded that changes in school building has made learning more interesting for the children and the teacher as abstract notions are better understood through concrete examples and there is decrease in vandalism and negative behaviour of children in schools. Munyi and Orodho (2014) specified that that attractive school environment ensure retention and schools lacking enough resources negatively impacted on the quality of teaching learning thus lowering achievement of learners.

However, learning outcomes of students with respect to parameters of interacting with English language; and dealing with complexity of numbers and geometry were not encouraging. So, more specific BaLA interventions be developed related to learning of English language and dealing with complexity of numbers and geometry for better results.

No significant difference was found between learning outcomes of grade-III male and female students. It indicated that male and female students were following BaLA concepts in schools for learning. But, a significant difference was found between learning outcomes of grade-III students of rural and urban schools.

The overall results pointed out that developed BaLA concepts in the schools for primary class students have a positive effect on their learning outcomes. The Government has to take initiatives to develop more concepts related to BaLA in all the schools. Teachers need to be trained during the pre-service and in-service training about usage of BaLA concepts in teaching. Through BaLA concepts, students can learn at their own by exploring again and again as it is an activity based learning which is child friendly.

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