

## REACHING THE UNREACHED: COGNITIVE DEVELOPMENT OF GIRLS FROM MARGINALIZED COMMUNITIES THROUGH AN ACCELERATED LEARNING PROGRAMME

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### ABSTRACT

In the developing countries the challenge of educating the marginalized sections of society is a huge one and it calls for interventions at the micro level that could then be up scaled, through research and evidence based evaluative processes. This paper reports a study that was conducted on adolescent girls in the age group of 10 to 14 years, who were early school dropouts or never enrolled. These girls were put through a carefully planned, innovative accelerated programme, patterned as a bridge course in a residential mode for a period of one year. The aim of the programme was to enable them to catch up with the five years of schooling that they had missed through a specially designed, compacted curriculum in Language, Mathematics and Environmental Studies.

The idea was to facilitate their mainstreaming into the formal school system. The curriculum helped them to prepare for and take the class five examination, which served to formally certify successful completion of primary education. The objective was also to empower them through a multi pronged approach of personal, social and cognitive development in which their self esteem and identity were built up and they were encouraged to dream, aspire and also make efforts to further their education. The present study focused specifically on assessing the cognitive capabilities of the girls and to gauge their learning after completion of the programme. Their performance on cognitive tasks was studied and compared to their age related counterparts, who had been through regular schooling in the formal system of education. The findings of the study have significant implications for educational interventions aimed at mainstreaming out of school children, which is also one of the main aims of the Right to Education Act.

**KEYWORDS:** Accelerated Programme, Bridge Course, Mainstreaming, Situated Cognition

### INTRODUCTION

The 'Education for All' movement got galvanized across the globe mainly after the Jomtein World Conference, 1990. Significant emphasis was placed on compulsory basic education, early childhood care and education, programs for out-of-school children and literacy programs for adults. The quest was clearly to educate all. 'Education for All' was not a major concern in the developing countries, till it became a mandate of the governments through monetary support extended by the World Bank and the United Nation Bodies. The limitations of the government to reach the grassroots in a vast and diverse country like India, led to the spread of various kinds of educational interventions by NGOs across regions and contexts.

One such intervention by CARE India constitutes the locale of the present study. The intervention took place through a residential camp 'Udaan' meaning 'flight' designed for the education of marginalized adolescent girls in the

age group of 10 to 14 years. The camp was located in a block in Hardoi district, Uttar Pradesh. The camp provided educational opportunities to out-of-school girls from the villages in the block.

The girls were marginalized on account of caste and gender. They had either dropped out very early from school or had never gone to school. In Udaan, they were provided an opportunity to complete their primary education up to class five in a period of one year. Thus, what was envisioned for them was a 'bridge course' through a compacted curriculum based on the premise of accelerated learning. The subjects covered under this were language, mathematics and environmental studies. In addition, the girls were provided social education which enabled them to think critically on social practices and issues and build in them the capacity for discerning and intervening meaningfully in situations of constraint that surrounded them. They were provided a joyful learning environment to enhance their interest in continuing their education.

Since the intervention was an accelerated academic programme of a year's duration, operationalised through a compacted curriculum, the researcher was interested in exploring the cognitive abilities of the Udaan educated girls in comparison with those who had spent five years in primary education. A comparable group of non literate girls, matched on the basis of age and socio-economic context was also identified to assess the initial starting point in the girl's lives and study the importance of contextual knowledge in the teaching learning process.

### Research Questions

The study posed the following questions:

- How does the accelerated programme facilitate the development of cognitive abilities among the participant group?
- In what ways is the compacted curriculum in the accelerated programme appropriate in preparing them for mainstream secondary education?

### METHOD AND TOOLS

As the context of the study was very different and unfamiliar to the researcher, an initial exploratory visit was conducted for the purpose of getting familiar with the teaching learning and other co-curricular experiences offered at Udaan and also for understanding the socio-cultural context of the learners. The documents related to the accelerated programme were also studied during the exploratory visit. The visit helped in developing the tools, consisting mainly of specific cognitive tasks, located in the *situated cognition* approach to learning.

The construction of tools was guided by two main considerations:

- How Udaan educated girls compare with their formal school counterparts on formal cognitive tasks in the areas of language, mathematics and environmental studies.
- How they compare with their non-literate counterparts from the same villages, which they belong, on aspects of cognition.

To fulfil these considerations, two different sets of tools were developed. One set consisted of formal cognitive tasks for the Udaan educated and formal school girls and the other of contextual cognitive tasks for the non-literate girls.

The formal cognitive tasks were designed to assess the language abilities, mathematical and numeracy skills and awareness of the social and physical environment, of the formal school and Udaan educated girls. The rationale for selecting these three areas was that at the primary level, the three subjects taught are usually language, mathematics and environmental studies. Since the main objective was to compare Udaan educated girls with their formal school counterparts, the common base and most obvious choice became the formal curriculum related tasks.

However, within these formal cognitive tasks, items and situations which involved transfer of learning, application of skills and scope for divergent and original thinking, were also included.

### **Cognitive Tasks for Language Skills / Abilities**

The tasks designed to assess the language abilities of the girls focused on figures of speech, narration exercises, reflective skills and imagery based activities, drawn from situations related to the immediate contexts and day to day living experiences of the girls. They also took into account their aspirations at the village level and at the national level. They specifically purported to assess:

- The girl's articulation abilities
- Language expression skills and
- Nature and richness of vocabulary used.

The purpose was also to explore the use of colloquial terms and phrases and to gauge their ease at using the standard language. Keeping in mind these above mentioned objectives, care was taken to ensure that the items constructed, had an open ended structure. For instance, the girls were asked to perform on items dealing with figures of speech by using words of their own choice, rather than being asked to respond to a set of fixed or given words.

This was done with the additional purpose of seeing whether there were some deeper meanings to the words chosen and in the articulation of ideas. This task was designed to assess proficiency in Hindi, primarily for the reason that in the lower classes, it is Hindi which is taught. English has a rudimentary significance at this stage.

### **Mathematical Skills and Abilities**

The cognitive tasks here consisted of a set of problems, situated in the day to day context of the girls. They specially purported to assess:

- Computational skills, familiarity and ease with measurement units and their inter-conversions
- Ease in handling digits, place values, fractions, decimals, percentage, area, volume etc.

Many of the problems were woven around village situations, such as storage of grains, purchasing in the market and animal rearing related activities. Some problems which measured direct operations were also included.

### **Environmental Awareness and Sensitivity**

The tasks included in this domain focused on knowing:

- The girl's sensitivity to living and non-living resources around them
- Their understanding of inter-relationships between objects and phenomenon in their environment

- Their awareness and concern about conserving their local natural resources (water etc.) and their ability to relate effectively to the physical and social environment, in which they live.

In order to construct a set of meaningful formal cognitive tasks, which incorporated all the specific objectives of language, mathematics and environmental studies and also relate them with the formal school curriculum, an extensive survey-cum-study was done of the formal school curriculum at the primary, middle and secondary stages. The reason for doing this was to ensure that the tasks set up in the tools, would serve to assess the knowledge base and cognitive capabilities of the girls, up to the primary level at least.

Further, since many girls were still continuing their studies in formal schools and their population ranged from class VI to X, it was considered essential to be familiar with their curriculum as well and include some tasks drawn from this level.

Text books from a number of sources were studied to know the content details across levels and to enhance the validity of content selection. Majority of the tasks constructed, targeted the primary level. A few tasks however, targeted learning at the class eight and nine levels, too. It may be asked as to why a single set of items for the entire sample range was used. The basic reasons for this were as follows:

- Since the task items were of an open-ended nature, they allowed for the possibility of assessing multiple cognitive levels, through the choice of words and ideas in the language and EVS components and the extent of operations in the mathematics portion.
- Secondly, since one was not quite sure about the nature of the sample one would get ultimately, as there were many prevailing uncertainties about whether the required number and nature of girls, would actually come.

As mentioned earlier, the second, tool which consisted of contextual cognitive tasks, was designed for the non-literate girls. Here, the emphasis was on assessing the observation and estimation skills of the girls and also gauging the nature and extent of logical thinking shown by them, in situations related to their immediate context and environment.

Since the study aimed at in-depth process based analysis, the sample size was kept small. The sample consisted of 17 Non-literate girls, 18 Formal School girls and 20 Udaan Educated girls. The girls belonged to all the five batches of Udaan and their counterparts in formal schools (classes VI to VIII) as well as their non-literate age mates. The slight variation in the three sample groups happened on account of the tools being administered over a period of two and a half days. Some girls had to go back home and therefore, could not participate fully in the study.

It was very difficult to get the non-literate girls from comparable villages to come. They were reluctant; their parents were not sure about sending them and for many of them the distance between their home and the camp was a limiting factor. Also, absencing themselves from their household tasks was difficult.

## **FINDINGS AND DISCUSSIONS**

The findings are depicted graphically

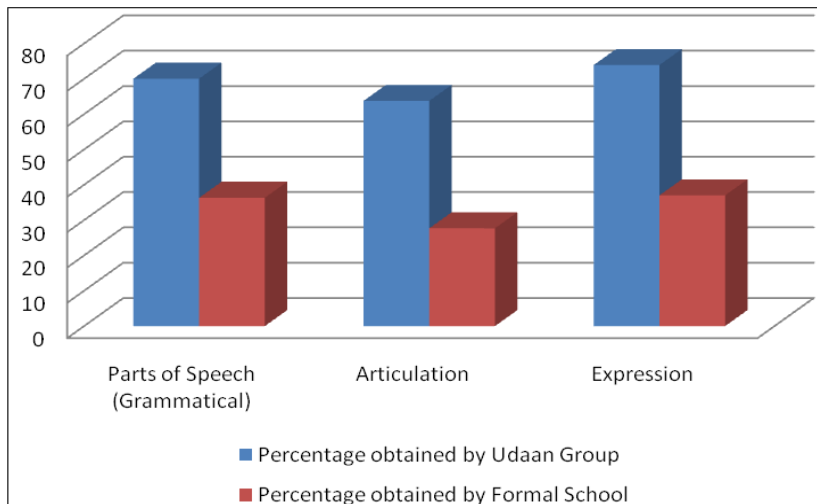


Figure 1: Skills in Language for Udaan Educated and Formal School Girls

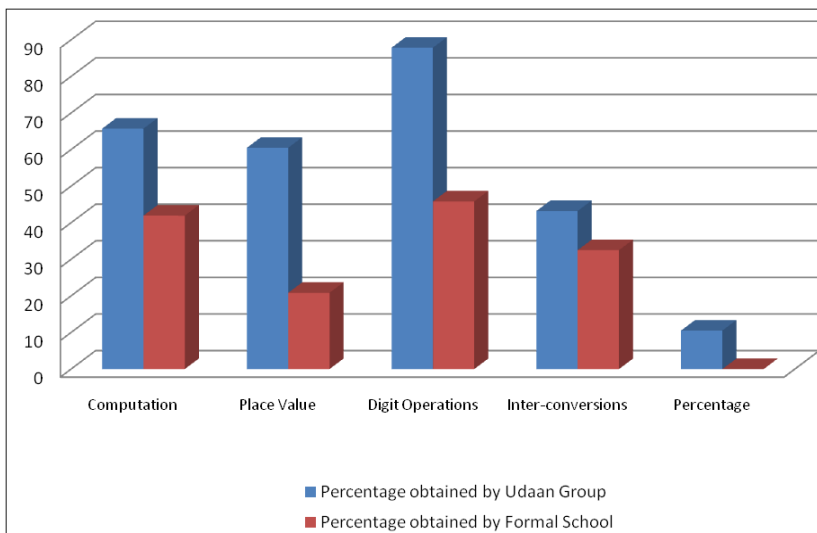


Figure 2: Mathematical Skills and Operations for Udaan Educated and Formal School Girls

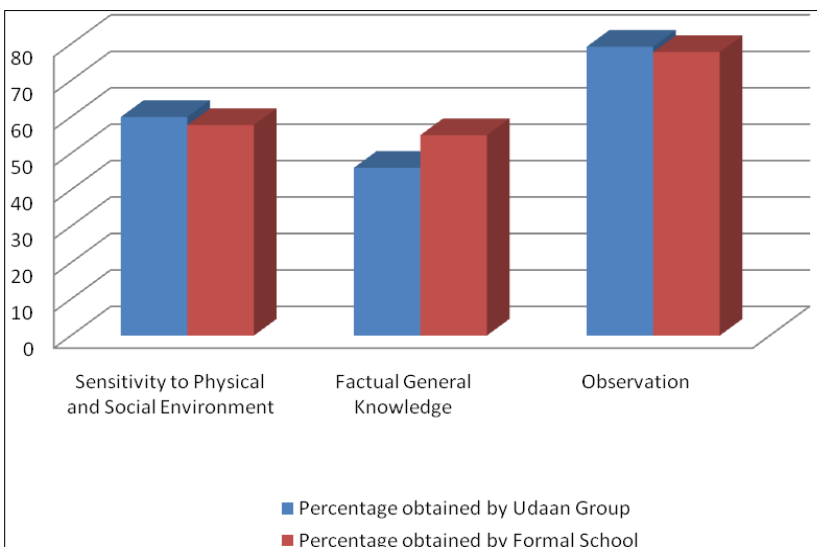


Figure 3: Skills and Competencies in EVS for Udaan Educated and Formal School Girls

### **Cognitive Abilities and Processing Skills: A Comparison of the Three Groups of Girls**

One of the basic objectives of the present study was to investigate how the Udaan educated girls think, understand and form concepts (in the areas of language, mathematics and environmental studies), in comparison to their formal school and non-literate counterparts. Keeping this in mind, an attempt was made to draw out a comparison in terms of their cognitive abilities and processing skills. It was felt that probing into their generic cognitive skills, would help to provide insight into their thinking patterns, the ways in which they relate to their natural and social environment, the ways in which they articulate their ideas and understand the happenings around them.

The purpose of including a group of non-literate girls as a base for comparison in this task, was to identify the thinking patterns and cognitive abilities, which develop in girls of this age through the natural interactive processes, in the context in which they live. In the case of these girls no conscious or formal inputs are provided in terms of schooling experiences and therefore their cognitive abilities become a good base line for knowing, what girls naturally are capable of. In a sense, the Udaan educated girls were similar to the non-literate girls before they joined Udaan. To make the comparison more systematic and meaningful, eight generic cognitive abilities, which all the groups of girls were likely to exhibit, were identified. These included:

- Recalling
- Observing
- Discriminating and classifying
- Reasoning
- Concept networking
- Computation and estimation
- Articulation and expression
- Problem solving

Each of these involves processing skills, or a set of mental operations. The comparative analysis on each of these abilities, showed:

#### **RECALLING**

Findings and Discussion for the Non-Literate (NL), Formal School (FS) and Udaan educated girls (UG)

#### **Findings**

The NL group could perform successfully when the tasks related to their immediate context and areas of interest, such as eatables, animals and trees etc. The FS group showed a sporadic performance in language tasks relating to vocabulary building and parts of speech. In comparison, the UG group performed significantly better on these tasks. While the FS and UG showed a comparable performance on the tasks related to recall from their environmental context, UG performed significantly better on digit recalling operations.

## Discussions

The ability to recall develops naturally and therefore emerges strongly in the area of environmental studies which is related to the real living context of the girls. This explains the near equivalent performance of the two groups of girls when it comes to recall. However, in the areas of language and mathematics, the situation is somewhat different. These areas require practice and rehearsal, which were probably woven into the Udaan curriculum in a better manner. This probably explains the better performance of the Udaan girls, in these domains.

## OBSERVING

### Findings

The NL group could respond partially to the observation of phenomena around them. The FS girls showed fairly high levels of observational proficiency, but the UG outscored them in terms of the detail and the range of responses made, especially in the environmental studies tasks. In the open-ended tasks in the language tool, wherein the girls had to imagine situations, the UG cited more observations of the practices happening around them.

### Discussions

While to some extent the ability to observe is present naturally in all human beings, perhaps the Social Learning Curriculum in Udaan and a predominantly activity based approach of education, which the girls are exposed to, may have sharpened their observational skills and made them more sensitive and receptive to the happenings in their environment. This probably explains why their performance on observational tasks was better.

## DISCRIMINATING AND CLASSIFYING

### Findings

The NL girls could only attempt a few tasks relating to these abilities. On comparing the performance of the FS and UG however, it was found that the UG had finer dimension and more than one parameter, for classification. They showed multiple classification systems using varying criteria, where as the formal school girl showed more traditional responses. Both the groups were found to be comparable on their discriminating ability.

### Discussions

It is easier to discriminate but more challenging to explore varying dimensions, for classifications of objects. This requires a greater and more in-depth understanding of the attributes of various concepts. Perhaps, the discussion approach adopted in Udaan had enabled the girls to develop their concepts both, at an understanding and at a reflective level. They were also encouraged to reason out, physically engage with objects, do small projects - all of which help in developing this ability.

## REASONING

### Findings

The NL group's performance was found to be rather poor on the reasoning based tasks. Their responses used to halt at the recall level, itself. The FS group's performance was also found to be low on tasks related to inductive and deductive reasoning. The Udaan group's success rate was not exactly high but, the girl's did perform better than the FS group.

**Discussions**

Reasoning ability develops gradually over a period of time and usually, it is inductive reasoning which leads to the ability to generalize. The tasks requiring deductive reasoning usually are much more challenging. Perhaps, the one year period spent at Udaan had enabled the girls to build up their inductive thinking abilities, but it may not have been sufficient for the rigour required for deductive thinking.

**CONCEPT NETWORKING (INTER-RELATING CONCEPTS)****Findings**

The NL group could relate to concepts only in a very discrete manner. They were therefore, found to be poor in inter-relating concepts. The UG scored over the FS group when the tasks required concept networking in language. While both groups were quite similar in environmental studies and could inter-relate concepts well, this was not so in mathematics, where they found relating to inter-conversion of scales, decimals and fractions, difficult.

**Discussions**

Concept networking operations require a transfer of concept learning and therefore, represent higher level cognitive abilities. Perhaps, the mathematical operations were too complex for both the FS and UG group. Better observational and reasoning skills may have helped the Udaan girls to perform better in language and environmental studies.

**COMPUTATION AND ESTIMATION****Findings**

The NL group could perform simple computations of addition and subtraction, but they were not able to estimate distances, space-time relationships etc. They could however, estimate storing capacities, milk giving capacities of animals and such other activities in their immediate context. The UG showed significantly better performance than the FS group on area computations and operations involving zero.

Their performance was similar to the FS group on the task related to computation of fractions. The estimation skills of both groups were comparable. However, both groups needed more inputs on this ability.

**Discussions**

Computational operations are highly abstract and complex operations, requiring not only adequate understanding, but also a lot of drill and practice. Perhaps the instructional situations in Udaan, due to time constraints do not provide adequate time for this.

**ARTICULATION AND EXPRESSION****Findings**

The NL girls were quite hesitant to express themselves. Their responses were not well articulated, either. On comparing the FS and UG, the latter showed visible evidence of the use of richer vocabulary, better sentence construction and more creative language expression.



## Discussions

The ability to articulate and express oneself is not inborn and generally, depends upon the environmental stimulation and opportunities that an individual receives. Perhaps the discussion based approach, role plays and creative writing activities (wall magazine, diary writing etc.) in Udaan, were enabling experiences, which helped the girls to articulate and express themselves spontaneously, freely and creatively.

## PROBLEM SOLVING

### Findings

The NL group was not very forthcoming on the problem solving tasks. Between the FS and UG girls, the latter showed a consistent ability to take up and find solutions to problems relating to both, their social context and day to day living. Such tasks were mostly, in comparison, left unattempted by the FS group. The numerical problem solving ability was not significantly different in the two groups, although the UG did perform somewhat better than the FS group.

### Discussions

Problem solving is considered as a highly evolved cognitive skill. It encompasses all other cognitive abilities. Perhaps the teaching learning situations in Udaan, through their discussion and activity based approach in the Social Learning Curriculum, engendered the development of problem solving abilities in the girls, with respect to their social context. As regards the ability to solve mathematical problems, a much more strategic approach is required to foster higher level mental operations of complex computations.

Finally, a question may be raised about the validity of performance assessment of the Udaan educated girls, after a gap of one to five years. It would be worthwhile to point out here that the open-ended nature of the tools, enabled us to bring out the latent effects of the transfer of learning, acquired in Udaan. This was found to prevail later on in the formal school situations, as well.

If we were to validate the impact of Udaan immediately after the passing out of the girls, after (class VI), then we should have ideally assessed and compared the performance of class VI girls only. This would have ruled out the impact of formal school teaching in the later classes. However, it was observed that the class VI girls of the FS group had left the papers unattempted and hence class VII girls of the FS group, had to be considered as the basis for comparison.

Most of them also showed very poor performance. In fact, the performance of the VI class girls of the Udaan group matched with the VIII class girls of the formal school group.

## CONCLUSIONS

In this study an attempt has been made to explore the world of cognition and develop an understanding of the 'internal' and 'external' conditions that contribute to the cognitive development of the girls in the three groups, keeping in mind their respective contexts. An attempt has also been made, to identify the ways in which 'Udaan', through its curriculum and activities, has adapted to the cognitive levels of its learners and facilitated their further development in this sphere. The cognitive development of the girls has been traced in terms of certain generic cognitive abilities which cut across the subject domains (language, mathematics and environmental studies).

In a way the findings in this study helped us to substantiate our thinking that the environment and practices in Udaan, through its curriculum and transactional strategies, provided a strong scaffolding base which helped to enrich the cognitive abilities of its learners. So powerfully inculcated and sustained was this impact that it showed up in different cognitive tasks even after a gap of one to five years, especially in the areas of language and environmental studies. It is also pertinent to add here that the Udaan curriculum needs to be strengthened, in order to foster better mathematical skills, in its learners.

The findings further help us to suggest that there are some significant lessons in the practices under this intervention programme for the mainstream schools. The context sensitive facilitative structures woven into the programme address the socio-economic, emotional, mental and personal needs of the girl-learners and seem to transform them into cognitively and psychosocially empowered adolescents. The findings of the study have significant implications for educational interventions aimed at mainstreaming out of school children, which is also one of the main aims of the Right to Education Act.

### **ACKNOWLEDGEMENTS**

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