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Literacy Status of BRAC Primary School Completers

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Abstract

Literacy status of a sample of primary education completers from BRAC non-formal schools in 2016 and enrolled in grade six in various formal schools in the following year were assessed. Their performance in literacy was compared with a similar group of students taken from national literacy assessment under *Education Watch* 2016. A test-based literacy assessment tool developed for *Education Watch* 2002 was used. The findings reveal that although the BRAC school students bear a lower socioeconomic status than those in national sample they achieved significantly higher literacy rate than the comparison group of students. A similar result was observed in each of the four components of literacy viz., *reading, writing, numeracy* and *application of the 3Rs*. No gender difference was observed in national sample but girls outperformed boys in BRAC sample.

1. Introduction

Literacy status has been evolved as a popular means of understanding the state of education of countries population for long. The concept and definition of literacy vary from one country to another (UNESCO 2006). The range is so vast that while one country measures prose, poetry and numerical skills to understand literacy status of its population the other country tries to measure only reading ability (Kirsch *et al.* 2002; OECD 2016). The concept and definition of literacy also became more advanced over time particularly in developed countries such as Organization for Economic Cooperation and Development (OECD) and the North America (UNESCO 2006). As obvious, definition of literacy and rigor of measurement positively related to countries economic strength and goals and targets for future.

Official definition of literacy in Bangladesh is very simple – *ability of writing a letter for communication*. It is measured dichotomously – *literate* or *illiterate* (BBS 2011, 2015). Household heads, their spouses or any adult member are asked to report on the above ability of each member of their households. This may be called as ‘reported literacy’. Alternatively, a ‘test-based’ literacy assessment method was adopted by the *Education Watch* in 2002; for which a new definition of literacy was developed which contains skills on *reading, writing, numeracy* and their *application* (Ahmed *et al.* 2003). The definition of literacy is the following.

Possession of skills in reading, writing and numeracy related to familiar contents and contexts and the ability to use these skills in everyday life in order to function effectively in society.

This definition is much harder than the national one. The test instrument covered 24 items containing six in each component. In this initiative literacy is measured in a four-point scale viz., *non-literate, semi-literate, literate at initial level* and *literate at advanced level*. However, for practical purpose, the first two categories were termed as *non-literate* and later two as *literate*. The first national literacy assessment, using this instrument, was conducted in 2002 which was repeated 14 years later in 2016 (Ahmed *et al.* 2003; Nath and Chowdhury 2016).

The sixth of the 10 targets of the fourth Sustainable Development Goal (SDG) is on literacy which specifically gave a broader view of this (United Nations 2015). Literacy along with numeracy skills were targeted by the year 2030 for all youth and a substantial proportion of adults. Therefore, the education provisions need to be more serious in their students’ attainment of literacy and numeracy skills. This is more applicable for Bangladesh where school education is the principal source of gaining literacy skills (Ahmed *et al.* 2003; Nath and Chowdhury 2016).

The latest literacy assessment under *Education Watch* observed that on completion of primary education (duration of which is five years) a third remain *non-literate* (Nath and Chowdhury 2016). Children completing primary education recently and those completed at any time in the past were brought under this estimation. The literacy rate was 91% among those who completed primary education recently and were studying in grade six in the assessment year (i.e. 2016). Consequently, a question was raised in BRAC whether BRAC primary school completers are well equipped with their literacy skills in line with national statistics. Therefore, a literacy assessment survey was carried out on BRAC school completers of 2016. This paper presents a comparative analysis of the findings of this assessment with those of national assessment.

2. Method

2.1 Assessment of literacy status

The literacy assessment instrument had 24 items; containing six in each section. A short description of the items put in the test is provided in Table 1.

Table 1. Table of contents for literacy assessment test

Reading	Writing	Numeracy	Application of 3Rs
Two words with three alphabet characters in each	Two words familiar in everyday life	<ul style="list-style-type: none"> Counting objects Finding out a missing number 	<ul style="list-style-type: none"> Recognise time Recognise left and right on a picture
Two sentences related to everyday life	Two sentences in a familiar context	Simple arithmetic <ul style="list-style-type: none"> subtraction multiplication 	<ul style="list-style-type: none"> Know different sides of a map Ability to write own address
A comprehension passage containing environmental messages followed by two questions of MCQ type	Describe an object with five sentences	Problem solving needing skills of <ol style="list-style-type: none"> subtraction and division and multiplication and division 	<ul style="list-style-type: none"> Ability to prepare a simple balance sheet Absorbing message from a billboard

Source: Ahmed *et al.* (2003)

Keeping the definition of literacy (mentioned earlier) in mind following are the descriptions of the four levels of literacy.

Non-literate: Lack of ability to decode alphabet, recognise words, write words or count objects; and, therefore, inability to use literacy skills in real-life situations.

Semi-literate: Ability to recognise and write some words, to count objects and use numbers at a very basic level; extremely constrained in use of the literacy skills in real-life situations.

Literate at initial level: Ability to read and write simple sentences in a familiar context; possessing skills of the four basic rules of arithmetic; limited use of these abilities and skills in a familiar context in real-life situations.

Literate at advanced level: Ability to read and write with fluency in varying contexts; competency in the four arithmetic rules and mathematical reasoning; ability to use these skills in everyday life and independently in further learning.

An equal weight was given to each of the four components of assessment – 25 marks for each, totalling 100 for the whole test. In other words, a respondent received a score between 0 and 100 in the overall test and between 0 and 25 in an individual component. Whatever the case (overall or each component) was, respondents availing a score <25% was categorised as *non-literate*, 25–49% as *semi-literate*, 50–75% as *literate at initial level* and 75%+ as *literate as advanced level*. For practical purpose, those falling in the category of literates at the *initial* level and those at the *advanced* level were collectively designated as *literate*.

2.2 Sample

The national literacy survey under *Education Watch* was carried out on those aged 11 years or more. The national sample contained 350 children completing primary education in 2015 and were studying in grade six in 2016. Twenty-two of them were below 11 years; so they were not assessed. Therefore, the number of children under assessment was 328 who were in grade six at the time of assessment. Of them 162 were boys and 166 were girls. These children came from 270 neighbourhoods.

For BRAC, 30 schools were randomly selected from 7,380 schools completing primary education in 2016. The plan was to randomly select 10 boys and 10 girls from each. But in some schools adequate number of students of particular gender was not available. Therefore, 16 more schools had to be considered. Finally 600 students (300 boys and 300 girls) completing grade five in 2015 from 46 schools were brought under literacy test. Of them, 37 did not admit in grade six and 91 were below 11 years. To make BRAC sample comparable to the national sample, these children (37 + 91 = 128) were excluded from the analysis. Therefore, this analysis considered 472 primary completers of BRAC schools – 240 boys and 232 girls. Sample size is provided in Table 2.

Table 2. Sample size

Samples	Gender		Both
	Boys	Girls	
National	162	166	328
BRAC school	240	232	472

The national literacy survey under *Education Watch* was done on May–July 2016 and the same for BRAC school graduates was done on February–March 2017. Respondents of both the groups were sixth graders in the respective assessment year.

2.3 Reliability and validity

Details of validity of the test is portrayed in Ahmed *et al.* (2003). Both *intrinsic* and *external* validity were ensured while developing the instrument. Reliability of each of the test items as well as the whole test were also assessed at that time. Using Spearman-Brown formula, reliability of the 2016 national data was found at 0.93. Mostly a similar reliability coefficient was found in BRAC sample too. Therefore, the literacy test data used in this study are 93% reliable.

3. Findings

3.1 Socioeconomic background

Students in the national sample were slightly older than the BRAC school students. Average age of the students in national sample was 12.4 years whereas, it was 12 years among BRAC school students (Table 3). However, median age was 12 years for each sample. Of the BRAC school students, 71.7% belonged to age 11 or 12 years with equal distribution and a fifth was 13 years old. On the other hand, about a fourth of the national sample belonged to age 11 years and another quarter belonged to age 13 years. Age of about 37% of them was 12 years.

Table 3. Age distribution (%) of sample students

Age (in years)	National sample	BRAC school
11y	24.1	36.2
12y	36.9	35.5
13y	24.3	20.0
14y	10.2	6.0
15y+	4.6	2.3
Total	100.0	100.0
Mean	12.4	12.0
Median	12.0	12.0

Educational qualifications of the parents of BRAC school students were lower than that of the students in national sample. Whereas, 34.4% of mothers and 38.7% of fathers of the students in national sample never been to school; these figures were 37.9 and 45.4%, respectively in the case of BRAC school students (Table 4). Proportionately more parents with 10 or more years of education (secondary completion) was also observed among those in the national sample than those in BRAC schools. Further analysis of data showed that both the parents of 25.3% of BRAC school students and 20.9% of national sample students had no schooling. This means that BRAC schools catered more first generation learners than the national average on this. Both the parents of another quarter of BRAC school students enrolled in school but left school before completing primary education. Such case was observed among 22.2% of students in national sample. Aggregating the above, none of the parents of over half of the students of BRAC schools and 43% of those in the national sample crossed primary education.

Table 4. Percentage of students by background characteristics

Characteristics	National	BRAC school	Characteristics	National	BRAC school
<i>Mothers education</i>			Non-Muslim	11.6	6.5
Nil	34.4	37.9	Small ethnic groups	4.5	5.7
Grades I–IV	25.1	23.7	Having electricity at home	87.4	87.1
Grades V–IX	34.0	34.8	Labour sale	31.3	39.0
Grades X+	6.5	3.6	<i>Food security status</i>		
<i>Fathers education</i>			Always in deficit	6.6	4.3
Nil	38.7	45.4	Sometimes in deficit	20.2	30.4
Grades I–IV	19.8	22.5	Breakeven	40.7	39.0
Grades V–IX	30.8	27.5	Surplus	32.6	26.3
Grades X+	10.7	4.6			

BRAC school students were found economically poorer than their counterparts in national sample. This was observed in two ways. Firstly, at least one person from each of the 39% of the households of BRAC school students sold manual labour at least 100 days a year which was 31.3% in the national sample (Table 4). Secondly, in terms of

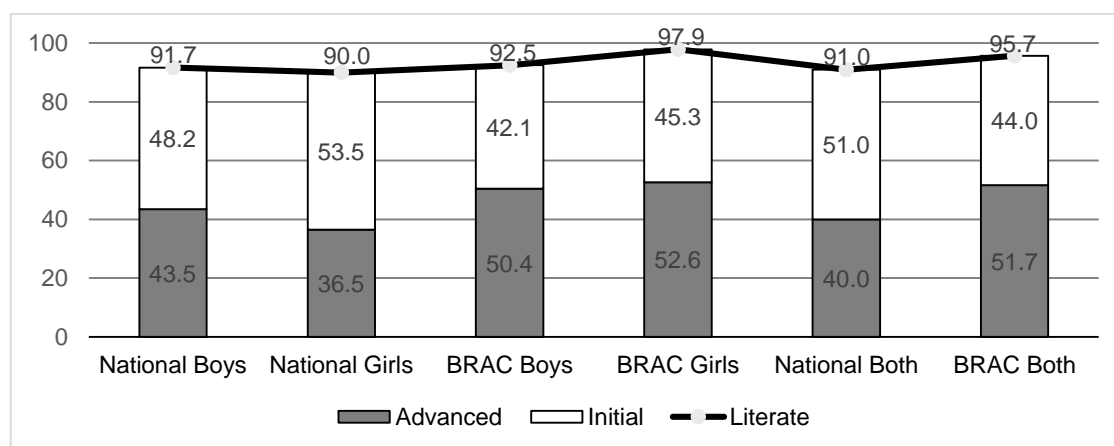
self-rated yearly food security status, 34.7% of the BRAC school students belonged to *deficit* households (4.3% *always* and 30.4% *sometimes*) which was 26.8% in national sample (6.6% *always* and 20.2% *sometimes*). Higher proportion of surplus household was observed in national sample than in BRAC school sample (Table 4).

No difference was observed between the two groups of students in terms of availability of electricity at home (Table 4). Whereas, 11.6% of the students in national sample came from non-Muslim households it was 6.5% in BRAC school sample. Proportion of students from small ethnic groups was 4.5% in national sample and 5.7% in BRAC school sample.

3.2 Achievement of literacy

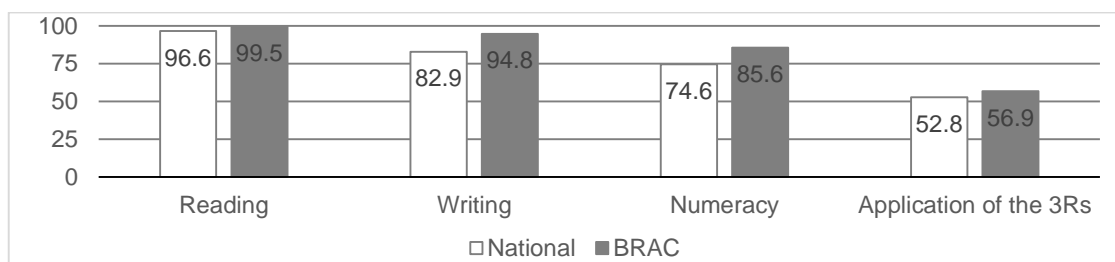
Among the sixth graders in the national sample, 40% achieved advanced level literacy skills and 51% achieved initial level skills (Figure 1). These rates were 51.7 and 44%, respectively among the comparable group of BRAC primary schools. Therefore, on completion of primary education, the literacy rate was 91% at national level compared to 95.7% among BRAC school graduates. Boys' literacy rate was 1.7 percentage points higher than that of girls at the national level. On the contrary, girls were 5.4 percentage points ahead of boys in BRAC schools (97.9% versus 92.5%; $p < 0.01$). Whereas, 50.4% of boys and 52.6% of girls of BRAC schools achieved *advanced level* of literacy skills, these figures were 43.5 and 36.5%, respectively in national sample. This clearly shows that BRAC school graduates were not only much ahead of the national average in achieving *advanced level* literacy skills, gender difference was also much less among them. At the national level, boys were seven percentage points ahead of girls in achieving *advanced level* literacy skills.

Figure 1. Advanced and initial level literacy rates



Component-wise analysis shows that the students of both the samples showed best performance in *reading* skills followed by *writing* and *numeracy*, respectively (Figure 2). Both groups performed worst in *application of the 3Rs*. The BRAC school graduates performed better than the national average in each of the four components. Gap between the two samples was highest in *writing* skills (11.9 percentage points), followed by *numeracy* skills (11 percentage points). This was least in *reading* skills (2.9 percentage points). The gap was 4.1 percentage points in *application of the 3Rs*. More analyses on the above are provided in Annexes 1 to 3.

Figure 2. Percentage of students achieving at least initial level of skills in each component of literacy



In literacy rate, no gender difference was observed in the national sample; however, girls of BRAC schools were 5.4 percentage points ahead of their counterparts' boys (97.9% versus 92.5%; $p < 0.01$). Component-wise, gender difference was observed only in *application of the 3Rs* in the national sample where 59.4% of boys and 45.9% of girls achieved this ($p < 0.01$). In BRAC schools, girls did better than boys in two components viz., *writing* and *numeracy* and no difference was observed in rest two. Ninety per cent of boys and 97.8% of girls of BRAC schools had at least *initial level* of *writing* skills ($p < 0.001$). Such level of *numeracy* skills was achieved by 81.2% of boys and 88.4% of girls ($p < 0.05$).

Table 5. Percentage of students having at least initial level of skills in each component of literacy by gender

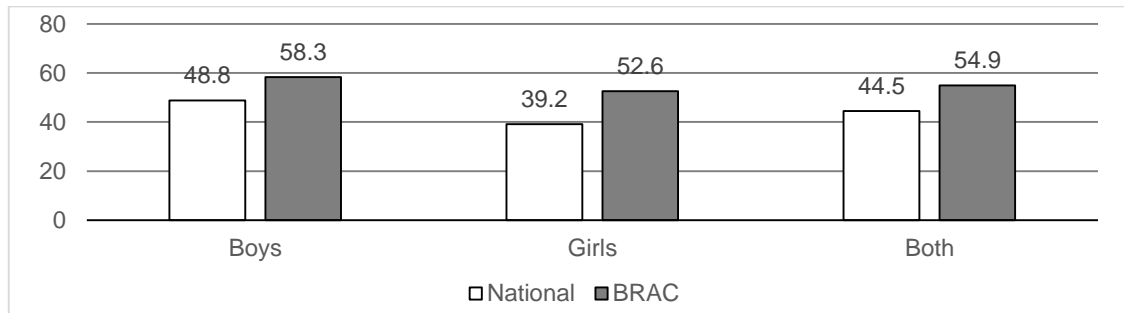
Gender	Components of literacy				Literacy
	Reading	Writing	Numeracy	Application	
<i>National</i>					
Boys	95.9	79.4	78.8	59.4	91.7
Girls	97.1	86.5	70.6	45.9	90.0
Significance	ns	ns	ns	$p < 0.01$	ns
<i>BRAC school</i>					
Boys	98.8	90.0	81.2	61.7	92.5
Girls	100.0	97.8	88.4	53.9	97.8
Significance	ns	$p < 0.001$	$p < 0.05$	ns	$p < 0.01$

ns = not significant at $p = 0.05$

3.3 Number of skills achieved

Percentage distribution of students by number of competencies in which they achieved at least *initial* level of skills is provided in Annex 4. Of the BRAC school students, 0.4% achieved none, 3.2% achieved one component, 10.2% achieved two, 31.3% achieved three and 54.9% achieved all four literacy components. These figures were 2.7, 6.8, 15.6, 30.4 and 44.5%, respectively for the national sample. This shows that BRAC school students were much ahead of the students in national sample in achieving all four components of literacy (54.9% versus 44.5%; $p < 0.01$). Although boys were ahead of girls in both the samples, no statistical gender difference was observed in this case. On the other hand, BRAC school boys surpassed their counterpart boys in national sample in achieving all four skills (58.3% versus 48.8%; $p < 0.05$). A similar relationship was observed among the girls of both the samples (52.6% versus 39.2%; $p < 0.01$). However, the gap was wider for girls than boys.

Figure 3. Percentage of students achieving all four literacy components by student group and gender



3.4 Logistic regression analysis

Multivariate logistic regression analysis was carried out considering literacy and its four components as dependent variables and 10 characteristics of students as independent variables. The purpose of this exercise is to see whether the differences between the estimates of national and BRAC samples still continue after controlling the effects of various characteristics of students. In addition to student group (national/BRAC), the characteristics include gender, age, mothers education, fathers education, religion, ethnicity, having electricity at home, labour sale status of household, and household food security status. The five dependent variables are dichotomous in nature. Of the independent variables, age and parental education are continuous and the rest are categorical variables. Annex 5 provides measurement of these variables.

Main results of the regression analysis are presented in Table 6. Considering the main focus of this study results related to the two groups of students are mainly provided which include odds ratios, 95% confidence intervals (CI) of odds ratios, level of significance of difference between national and BRAC, and some information on the regression models. The findings reveal that BRAC school students showed significantly better performance in literacy as well as its four components than the national performance. However, level of significance of the differences varied from one component to another. Overall, BRAC school students were 2.61 times more likely to do better than the national average in *literacy* skills ($p < 0.01$). This was 1.25 times in *reading* skills ($p < 0.05$), 3.95 times in *writing* skills ($p < 0.001$), 2.31 times in *numeracy* skills ($p < 0.001$), and 1.26 times in *application of the 3Rs* ($p < 0.05$). Note that literacy rate significantly increased with increase of fathers educational qualifications ($p < 0.05$) and students having electricity at home were more likely to be literate than those had no such facility at home ($p < 0.05$).

Table 6. Odds ratios (OR) of the logistic regression coefficients against 'student group' predicting their skills in literacy and its various components

	Reading	Writing	Numeracy	Application of the 3Rs	Literacy
Student group					
National	1.00	1.00	1.00	1.00	1.00
BRAC	1.25	3.95	2.31	1.26	2.61
95% CI of OR	1.09–2.36	2.33–6.70	1.58–3.38	1.12–2.25	1.41–4.83
Significance	$p < 0.05$	$p < 0.001$	$p < 0.001$	$p < 0.05$	$p < 0.01$
-2 Log likelihood	95.73	458.75	41.50	73.22	356.06
Cox & Snell R ²	0.05	0.08	0.05	0.04	0.04
Nagelkerke R ²	0.30	0.17	0.08	0.05	0.09
Model Chi-square	38.40	66.00	41.50	29.63	29.27

Whether the two sample groups of students showed a similar or different performance in achieving all four components of literacy controlling for the effects of the above socio-economic characteristics was explored through building another regression model. The analysis reveals that BRAC school students were 1.59 times more likely to achieve all four literacy components than those in national sample ($p < 0.01$) (Table 7). Other factors significantly predicting the dependent variable are gender and fathers education. Plausibility of achieving all four components significantly increased with increase of fathers educational qualifications ($p < 0.01$). Boys were 1.36 times more likely to achieve all four components than girls ($p < 0.05$).

Table 7. Odds ratio (OR) of the logistic regression coefficient against ‘student group’ predicting their skills in all four components of literacy

	All four components of literacy
Student group	
National	1.00
BRAC	1.59
95% CI of OR	1.18–2.15
Significance	$p < 0.01$
-2 Log likelihood	1072.64
Cox & Snell R^2	0.05
Nagelkerke R^2	0.06
Model Chi-square	38.84

4. Conclusion

Whether BRAC primary school completers are well equipped with their literacy skills in line with national statistics– was the main concern of this investigation. Before exploring the issue a comparison of background characteristics of BRAC school students and those sampled for national assessment was done. It was clearly observed that BRAC school students held a lower status in terms of parental education, labour sale status of household, and household food security rating. Even then, BRAC school students achieved a higher literacy rate than the comparison group of students. Better performance of BRAC school students was also noticed in each of the four components of literacy viz., *reading, writing, numeracy* and *application of the 3Rs*. Whereas, no gender difference in literacy rate was observed in the national sample, girls outperformed the boys in BRAC sample. Similar gender relationship of BRAC school students was also observed in *writing* and *numeracy* skills. Otherwise, boys of the national sample did better than respective girls in *application of the 3Rs*. Proportion of students achieving all four components of literacy was also significantly higher for BRAC schools than the national figure.

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Annexes

Annex 1. Percentage distribution of students by literacy levels, student group and components of literacy

Student group/ literacy levels	Components of literacy				Literacy
	Reading	Writing	Numeracy	Application	
<i>National</i>					
Non-literate	1.9	5.1	6.7	5.3	2.3
Semi-literate	1.5	12.0	18.7	41.9	7.8
Literate-initial	4.1	42.2	33.2	33.2	50.4
Literate-advanced	92.5	40.6	41.4	19.6	39.4
Total	100.0	100.0	100.0	100.0	100.0
<i>BRAC school</i>					
Non-literate	0.0	1.8	2.8	5.3	0.5
Semi-literate	0.5	3.5	11.7	37.7	3.8
Literate-initial	3.3	31.7	33.0	34.5	44.0
Literate-advanced	96.2	63.1	52.6	22.5	51.7
Total	100.0	100.0	100.0	100.0	100.0

Annex 2. Percentage distribution of students in national sample by literacy levels, student group and components of literacy

Levels of literacy	Reading		Writing		Numeracy		Application		Literacy	
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Non-literate	1.8	4.1	5.9	2.3	3.6	9.4	4.1	6.4	2.4	2.4
Semi-literate	2.4	16.5	7.6	0.6	17.8	20.0	36.5	47.4	7.1	8.8
Literate-initial	3.5	41.2	43.5	4.7	34.3	31.8	38.8	27.5	47.6	52.9
Literate-advanced	92.4	38.2	42.9	92.4	44.4	38.8	20.6	18.7	42.9	35.9
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Annex 3. Percentage distribution of BRAC school students by literacy levels, student group and components of literacy

Levels of literacy	Reading		Writing		Numeracy		Application		Literacy	
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Non-literate	0.0	0.0	2.5	1.3	3.8	2.2	6.2	4.7	1.2	0.0
Semi-literate	1.2	0.0	7.5	0.9	15.0	9.5	32.1	41.4	6.2	2.2
Literate-initial	5.8	1.7	36.7	28.4	28.8	35.8	40.4	30.6	42.1	45.3
Literate-advanced	92.9	98.3	53.3	69.4	52.5	52.6	21.2	23.3	50.4	52.6
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Annex 4. Percentage distribution of students by number of competencies in which they achieved at least initial level of skills, sample type and gender

Number of components	National			BRAC school		
	Boys	Girls	Both	Boys	Girls	Both
Nil	3.1	2.4	2.7	1.2	0.0	0.4
One	6.8	6.6	6.8	5.4	1.7	3.2
Two	11.1	18.7	15.6	12.1	9.1	10.2
Three	30.2	33.1	30.4	22.9	36.6	31.3
Four	48.8	39.2	44.5	58.3	52.6	54.9
Total	100.0	100.0	100.0	100.0	100.0	100.0

Annex 5. Measurement of variables used in regression analysis

Variables	Measurement
<i>Dependent</i>	
Literacy	1 = literate, 0 = non-literate
Reading	1 = have skills, 0 = don't have
Writing	1 = have skills, 0 = don't have
Numeracy	1 = have skills, 0 = don't have
Application of the 3Rs	1 = have skills, 0 = don't have
All four components	1 = yes, 0 = no (nil to 3 components)
<i>Independent</i>	
Student group	1 = national, 2 = BRAC
Gender	1 = boy, 2 = girl
Age of student	11–17, in years
Mothers education	0–14, years of schooling completed
Fathers education	0–16, years of schooling completed
Religion	1 = Muslim, 2 = non-Muslim
Ethnicity	1 = Bangali, 2 = small ethnic groups
Electricity at home	1 = have, 2 = have not
Labour sale status	1 = sale labour, 2 = don't sale
HH food security status	1 = deficit, 2 = breakeven, 3 = surplus