

The impact of BRAC's education programme on raising basic education levels for the children of rural Bangladesh

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Dedication

*Those 700 children
of rural Bangladesh who might
have missed the opportunity of basic education,
as the funds were used to send me to Oxford.*

Abstract

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This dissertation explores the impact of the non-formal education programme (NFPE) of the Bangladesh Rural Advancement Committee (BRAC) in the achievement of basic education for the rural Bangladeshi children. The concept of basic education was constructed from the Declaration of the World Conference on Education for All (WCEFA), Jomtien 1990. The instrument used to test the children was developed in Bangladesh to assess children's educational performance on a number of measures. A 'summative' type of evaluation strategy was followed in this research. Three groups with different educational experiences were assessed; these included children who attended BRAC's NFPE, formal school and children who had never attended school. The study was conducted in five rural areas of Bangladesh where a socio-demographic surveillance was underway. A total of 720 randomly selected children, equally distributed by school category and sex, were assessed in this study. Background information for the children was collected by interviewing their parents. Assessing the children and interviewing their parents were done in their homes. The data were collected by a group of field researchers, who were given a three-day intensive training by the author of this dissertation. Both bi-variate and multivariate statistical techniques were used to analyse the data collected from interviews and tests. The analyses revealed that the impact of BRAC's NFPE was significant in the basic educational achievement of the children. Of the four components of basic education, NFPE children did significantly better in life skills and writing than their peers in formal schools. Equal performance was observed among them in reading and numeracy. Although the children who had never attended school in general did poorly, some had life skills knowledge and more than half had numeracy skills. This study concludes that BRAC's education programme is having an impact on basic education in rural Bangladesh. Neither the formal nor the non-formal system could reach the WCEFA goal to achieve an 80% level of basic education, however NFPE could get close near to the target. Finally, some recommendations are made for improving the quality of basic education for rural Bangladeshi children.

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The general socio-economic situation of Bangladesh is unsatisfactory. The country is characterised by pervasive poverty, a rural based economy, high levels of under-and unemployment, rapid population growth, frequently occurring natural disasters, much illiteracy, a high degree of urban-rural differentiation and a generally low status of girls and women. As per international economic classification the country is placed in the lowest category of countries with per capita income of US\$ 220. According to the Human Development Index (HDI), Bangladesh ranks 144th among 175 countries and according to the Human Poverty Index (HPI) it ranks 67th among 78 countries (UNDP, 1997). A nation wide study conducted by the Bangladesh Institute of Development Studies (BIDS) showed that about 40% of the rural households in Bangladesh lie under the poverty line (Rahman, 1995).

Several aspects of Bangladesh can be exploited to ensure its development. According to Ahmed et al., (1993), Bangladesh may be distinguished from many other countries with similarly low levels of income per capita by several factors that have a direct bearing on its ability to expand access to primary education. These are linguistic, ethnic and cultural homogeneity, a relatively stable political environment in recent years, a functioning public administration system and a large sophisticated NGO community. In Bangladesh, many national and international voluntary social welfare and development agencies are involved in development and poverty alleviation work. Eradication of illiteracy from the society is also a part of their activities.

Bangladesh has stated its commitment at national and various international levels to attain Education for All (EFA) and to ensure quality basic education. Bangladesh is one of the major signatories of the United Nations Charter on the rights of the

children, which aims to ensure proper development of children in the context of family, economy and politics. The constitution of Bangladesh also puts much emphasis on ensuring the rights and privileges of children. The country is committed to the goal set in the World Conference on Education for All held in Jomtien, Thailand in March 1990 and the World Summit on Children held in New York in September 1990. Bangladesh is also committed to implement the summit declaration on Education for All of nine High Population Developing Countries held in New Delhi in December 1993 (Primary and Mass Education Division, 1995).

1.2 Primary education in Bangladesh

On independence in 1971, Bangladesh inherited a disparate and incomplete education system. After independence, the constitution of the People's Republic of Bangladesh recognised the need for education as a fundamental human right. According to Articles 15 and 17 of the constitution, providing education to all children is one of the fundamental responsibilities of the state. This responsibility is to establish a uniform system, extending free and compulsory education to all children up to a stage to be determined by the law and removing literacy within a determined time. In 1973, under an Act of Parliament, all Bangladeshi primary schools (36165) were nationalised with a view to improve the quality of education (Haq, 1996). The government has also formed several commissions and task forces in different times to recommend for the improvement of education system of Bangladesh. These are: Kudrat-E-Khuda Education Commission 1974, Kazi Zafar Ahmed Commission 1977, Mazid Khan Commission 1985, Mofizuddin Ahmed Commission 1988 and the Task Force for Primary and Mass Education in 1993. Between 1971 and 1989 each of the

new governments formed at least one education commission during their life time but none of these commissions reports were considered for full implementation. The Primary Education (Compulsory) Act was passed in 1990 (Government of Bangladesh, 1990). Compulsory primary education was introduced under this act for the first time in 1992 in 68 thanas¹ of the country and has been implemented all over the country since 1993.

The Directorate of Primary and Mass Education (DPME) is the main body responsible for implementing the national primary education system in Bangladesh. At community level, the School Managing Committee (SMC) and various local primary education committees play a supportive role. The Directorate of primary education co-ordinates the system with its district² and thana level offices. The Thana Education Officer (TEO) and his/her Assistant Thana Education Officer (ATEO) are responsible for the overall management and supervision of schools at the local level. Each ATEO supervises and monitors 15-20 schools. Though the ATEO's are expected to provide direct supervision and academic support to the teachers, they have not been able to play an expected leadership and supportive role (Chowdhury, Haq & Ahmed, 1996). Poor supervision of the primary schools by these authorities was documented by a study by Alam, Begum & Raihan (1996). The necessity of community participation in educational planning and management has been cited in various government documents (e.g., The Third Five Year Plan 1985-90, Primary Education Task Force

¹ Government's second stage administrative unit with an average population of 260,000. There are 460 such units in the country.

² Government's third stage administrative unit with an average population of 1.9 millions. There are 64 such units in the country.

estimated about 1.3 million children are enrolled in these schools, of which over 1.1 millions are in BRAC operated schools (Chowdhury et al., 1996). Although the formal schools directly follow the curriculum and textbooks produced by NCTB, this is not the case for non-formal education programmes. One study showed that 36.5% NGO's follow the NCTB curriculum, 36.5% follow the BRAC curriculum and the others use their own or the curricula of other NGOs (Campaign for Popular Education, 1995). It is to be mentioned that the above formal and non-formal institutions are unable to provide places for all the 18.5 million children of age 6-10 years. Due to incompleteness of the educational system many children are still out of classroom in Bangladesh (Brock & Cammish, 1991).

1.3 Education programme of BRAC

The Bangladesh Rural Advancement Committee (BRAC) was founded in 1972 as a relief agency to undertake resettlement activities among the refugees (due to the War of Independence of Bangladesh) in the north-eastern part of Bangladesh. Now it is the largest non-government organisation (NGO) in the country, implementing multisectoral programmes for the benefit of rural poor households of Bangladesh. BRAC's strategy is the 'targeted' development approach through village organisations. The majority of the beneficiaries of BRAC programmes are women, the most disadvantaged section of the Bangladeshi population. The main programmes that BRAC currently operates are the Rural Development Programme (RDP), Human Rights and Legal Education (HRLE), Income Generation for Vulnerable Group Development (IGVGD), Non Formal Primary Education (NFPE), and Health and Population programmes. Today BRAC programmes cover more than one third of the

86,038 villages of Bangladesh. The two main goals of its total activity are i) poverty alleviation and ii) empowerment of the poor (BRAC, 1995).

BRAC started its education programme in 1985 with 22 experimental schools. According to BRAC, “education not only accelerates the pace of development but also prepares people to participate meaningfully in the development process” (BRAC, 1993: 12). The objective of this experiment was to develop a replicable primary education model that would provide basic literacy, numeracy and social awareness for the poorest rural children. The target population of this experiment was those poor children who had not yet been reached by the formal school system or who had dropped out. The success of these experimental schools encouraged BRAC to open more schools over time (BRAC, 1994). The education programme of BRAC aims at

1. Reducing mass illiteracy and contributing to the attainment of basic education of children, especially those from the poorest families;
2. Contributing towards strengthening the government’s universal primary education programme;
3. Promoting increased participation of girls in education; and
4. Enhancing the positive influence of education in other areas such as population planning, public hygiene and health.

BRAC currently operates two separate models of primary schools for the children of two different age groups viz., the Non Formal Primary Education (NFPE) and the Basic Education for Older Children (BEOC). The Non Formal Primary Education (NFPE) was started in 1985 as a three-year programme for children aged 8-10 years. The Basic Education for Older Children (BEOC) was started in 1988 as a two-year

programme for children 11-14 years old. BEOC was extended to a three-year programme in 1993. It was observed that children older than this targeted age group are also enrolled in BRAC schools (Nath, 1996). The expansion of NFPE is much wider than that of BEOC. Through its Education Support Programme (ESP), BRAC also helps other small NGO's to replicate NFPE in their working areas.

BRAC schools are not intended to settle as permanent institutions. These schools address a single cohort of students who enrol during the same school year and move together through three years of schooling. Once that cohort completes a three-year cycle, the school ceases to exist unless there are at least 30 eligible children in the community (Ahmed et al., 1993). In recent years, BRAC schools have continued into a third or fourth three-year cycle in some areas. Before starting a school, surveys are conducted in prospective areas to assess demand for schools. Each school starts with 33 children, of which 70% must be girls. It is hoped that this proportion will lead to more educational opportunities for the girls in the society (BRAC, 1994).

The teachers of BRAC schools are usually married women who live in the school catchment area and have at least nine years of schooling. Once selected she/he is given an initial 15 day training at BRAC's training Centre, followed by a periodical training at the beginning of each year (BRAC, 1995). The same teacher teaches the same batch of 33 students through the entire three-year school cycle. Some of the teachers are also assigned in two nearer schools, if possible. This opportunity is given only to those teachers who completely served one three-year cycle (Ahmed et al., 1993).

Parent and community participation play an important role in all BRAC schools. Each school has a school management committee made up of 3 parents, a community leader and the teacher, who together are responsible for the smooth running of the school. This committee, with the help of other parents, takes care of the school, sets school times and vacations, and ensures the children's regular attendance. Meetings of all the parents are held once a month. On average 80% of the parents (mostly mothers) attend the meetings (BRAC, 1994).

BRAC's education programme has streamlined the broad-based formal curricula and tailored it to the essential needs of children living in a rural community. The curriculum incorporates the objectives that are addressed in the formal schools and is designed to cover the essential contents of the formal primary education curriculum. The NFPE curriculum consists of lessons in Bangla, Mathematics, and Social Studies. English is taught from the second year and religious education is taught in the third year of school. Learner centred and participatory teaching methods are followed in BRAC schools. Extra-curricular activities are very common in these schools which attracts the children to stay in school. Physical exercise, singing, dancing, drawing, crafts, group work, games, and storybook reading are used to help the creative thinking of the students. These activities are held within the school period, so each student can participate in them.

A typical BRAC school is a mud walled room with a thatched or tin roof. The minimum floor space is 336 square feet. Neither the teacher nor the students have desks in these schools; children sit on woven mats on a packed mud floor in a U-shape, with a blackboard and teaching aid in the front of the classroom (Ahmed et al.,

1993). School time is fixed in each season in the meeting of teacher and the parents. The classes are held for three hours each day, six days a week, and 270 days a year.

A decentralised management model which was developed by trial and error in BRAC's early years and now adopted to each of BRAC's programme, is adopted for the NFPE programme (Ahmed et al., 1993). Though the overall responsibility lies with BRAC's Executive Director, the central office of the Director of NFPE and its staff's work directly to implement the programme. A multistage supervision system with Regional Managers, Area Managers, Team-in-Charge, Programme Organiser/ Assistants are responsible for field management of NFPE. Each Regional Manager is responsible for 5,000 schools, each Area Manager is responsible for 500 schools, one Team-in-Charge looks after 80 schools and a Programme Organiser/Assistant supervises 15 schools. PO/AO's are the first line supervisors of the teachers and schools. They visit each school at least twice a week and also assist teachers as necessary. If any student does not attend her/his lessons the teacher or the PO/PA's visit her/his house to discover the cause and to motivate the child to attend school. The PO/PAs also attend monthly parents meetings and conduct monthly teachers' meetings. Regular reporting from lower level to upper level is compulsory in BRAC's education programme.

At present, a total of 35,175 NFPE schools are in operation in 22,160 villages of Bangladesh. More than 1.13 million children are enrolled in these schools and 33,524 teachers are engaged to teach the students (BRAC, 1995).

1.4 The concept of basic education: the Jomtien conference

The concept of basic education used in this study came from the declaration of the World Conference on Education for All held in Jomtien, Thailand in March 1990. Though the words 'basic education' are not new to the educational activists, the conference put much emphasis on it to fulfil the basic learning needs of the World's population. At this conference about 1500 participants including delegates from 155 governments, officials and specialists from 20 intergovernmental bodies and 150 non-governmental organisations participated. The conference discussed the basic learning needs of children, young and adults on the basis of the then global socio-economic context. After much discussion for five days the participants of the conference adopted the World Declaration on Education for All and the Framework for Action to Meet Basic Learning Needs (WCEFA, 1990). The conference observed that despite the 1948 Universal Declaration of Human Rights that "everyone has a right to education", the realities of 1990's are: more than 100 million children (including at least 60 million girls) have no access to primary education; the similar number of children and countless adults fail to complete basic education programmes; millions more satisfy the attendance requirements but do not acquire essential knowledge and skills; (WCEFA, 1990).

At the same time the conference also identified other problems which included: the threat of economic stagnation and decline; widening economic disparities between and within nations; dislocation of millions through war and civil strife; rapid population growth; preventable death of millions of children and widespread environmental degradation. According to the preamble of the declaration these

the British Comparative and International Education Society (Jolly, 1993). At the same time it should be recognised that many innovative initiatives have already been taken to improve education in many developing countries long before Jomtien (Little, 1994).

1.5 Education in developing countries and non-formal provision

Primary education has been accepted as a human right for almost half a century. It is well known that quality primary education is vital for the development of any nation, but it is still far from being universally available in most developing countries of the world (Colclough with Lewin, 1993). A majority of the developing countries are facing serious challenges in advancing the basic education of their young and adults (Levin, 1993).

The difference in educational provision between developed and developing countries is an important one. According to Lockheed (1993: 20), "schooling in developing countries takes place under conditions that are very different from those of developed countries". Giving examples Lockheed showed that the differentiation exists in curriculum, school environment, teacher-student ratio, teacher qualification, and the health and nutritional status of the learners. These differences create differences in the quality of education between developed and developing countries. The fact is that many governments in the less developed countries lack the financial resources, the administrative capacity, and/or the political will to implement the legislation necessary to fulfil basic education for their population (Ahmed et al., 1993).

The educational crisis that the world saw in the late 1960's made it clear that it may not be possible for the formal educational provision to meet the educational need for the world's population. The concept of non-formal education has started to grow from that time and gained currency very rapidly in the 1970's (Hamadache, 1985), though it was not a new concept. The reports of the UNESCO dealt with the similar concepts such as "community development and community education" in the 1950's and "literacy and functional literacy" in the 1970's (Radcliffe and Colletta, 1985). According to Coombs, the educational strategies of the nations should be much more comprehensive, innovative and integrated rather than narrow and inflexible in order to meet the educational needs of their populations. He also said that rapid linear expansion strategy of formal education system that dominated the 1950's and 1960's culminated in the world wide educational crisis (Coombs, 1985).

Educational provision may be categorised in three groups, these are: formal, non-formal and informal. According to Radcliffe et al., (1985) the classic definition of non-formal education was devised by Coombs, Prosser and Ahmed in 1973 (p. 10). Non-formal education is "any organised educational activity outside the established formal system--- whether operating separately or as an important feature of some broader activity--- that is intended to serve identifiable learning clienteles and learning objectives". To distinguish this definition from formal and informal system Coombs et al., also claimed that informal education is "the truly life long process where by every individual acquire attitudes, values, skills and knowledge from daily experience and the educative influences and resources in his or her environment --- from family and neighbours, from work and play, from the marketplace, the library and the mass media". On the other hand, formal education refers to "the hierarchical

structured, chronologically graded education system, running from primary school through the university and including, in addition to general academic studies, a variety of specialized programmes and institutions for full time professional and technical training" (cited in Radcliffe et al., 1985). From the above definitions it should be clear that the need to educate all the human beings of the world makes it important to consider all three types of educational provision. There are also misconceptions about formal education and non-formal education. Sometimes education is seen as a separate development sector like as industry, transport or agriculture. However, it is an essential component for the development of all the sectors. Moreover, non-formal education is not simply an alternative form of education or an educational provision for the poor or unschooled. It can serve people of all ages and in different stages of life (Coombs, 1985). Considering the learning needs that are essential for the people in both developed and developing countries, the following aims can be set for non-formal education, it: a) attempts to fulfil immediate and practical needs, b) occurs outside formal schools, c) adapts to individual needs, d) changes as learning needs change, e) serves voluntary student populations, f) involves part-time study, g) costs less than formal education, h) has flexible criteria for admission (Shavelson, Jiyono & Obemeata, 1985).

It is stressed here how far the learners of developing countries differ in educational opportunities compared to their peers in developed countries. How this gap can be reduced? Obviously, the first task should be to bring all the population (at least the children) into an effective educational system. That education must be closer to everyday life of the learners and also helpful for their well being. Due to the flexibility, creativity, target group approach and lower cost of the non-formal

education, this education system has been increasing in many developing countries including Bangladesh.

1.6 Bangladesh's effort towards basic education

Bangladesh is committed to achieve the goals set by the World Conference on Education for All. Delegates from both government and non-government levels participated in the conference. Immediately after the conference, at the initiatives of the NGOs, a new EFA-Network was been established as part of the global EFA-Network. This network brought the government, the non-government organisations and the donors together on a common platform. To develop a plan for sustaining action at the regional level, this network organised South-East Asia Regional Consultation meeting in February 1992. Bangladesh hosted the meeting.

In direct response to Jomtien the government of Bangladesh has taken several initiatives to raise enrolment levels of children in primary schools and to raise the level of basic education for these children. The primary education (compulsory) act was passed in the parliament just after the Jomtien Conference. A separate Ministry level Division under the name Primary and Mass Education was established in August 1992. Media (television, radio and newspaper) has been used to create awareness of the people regarding the importance of education. For example, attractive advertisements are shown on television and transmitted through radio. Primary education is made free for all children in government schools and education for girls is free up to grade eight in rural areas. Provision of scholarship has also been introduced to keep the girls in schools and the Food for Education (FFE) programme

is operating in some areas to protect dropout of the children of poor families. The present government (formed mid 1996) declared their intention to ensure the total eradication of illiteracy within ten years. A National Plan of Action was also prepared to meet the goal set by the World Conference on Education for All. In this action plan the government fixed Bangladesh's target towards education for all by 2000 AD. It was observed that Bangladesh's targets are behind the global target (Primary and Mass Education Division, 1995).

Complementary to the government efforts, different non-government organisations (NGOs) are also strengthening educational activities with their non-formal education programmes for the young children. The NGOs are trying to increase the number of schools in different locations of the country. Approximately 40,000 non-formal schools are currently running all over the country. Among the non-formal education programmes that currently operate in Bangladesh, BRAC's non-formal primary education (NFPE) programme is the largest one according to coverage of children and area (Chowdhury et al., 1996). The curriculum, management and supervision of the non-formal education programmes are designed in such a way that these schools attract young children and aim to ensure a certain level of basic education.

A Conference on Universal Primary Education in Bangladesh was held in August 1996 (Conference Secretariat, 1996). At this conference, officials from government departments, educationists, teachers, researchers, experts, NGO representatives and representatives of donor communities participated. This conference reviewed the ongoing activities of primary education and put recommendation for its strengthening

towards quality education. It is expected that this conference will strengthen government-NGO collaboration in the education sector.

1.7 Initiative to assess basic education

Above are the efforts to achieve the WCEFA goals but what about the measurement of level of basic education? In November 1991, an initiative was taken for the first time in Bangladesh to develop a practical methodology and measurement instrument to assess the attainment of basic education levels by the children in Bangladesh (Chowdhury, Ziegahn, Haque, Shrestha & Ahmed, 1994; Chowdhury, Mohsin & Nath, 1992). Two committees were formed for this purpose: (1) an advisory group, drawing upon diverse expertise in curriculum development, testing, statistics, policy planning, survey methods and NGO programmes from several institutions based in Bangladesh; (2) a five member task force to design test instruments and sampling methods. The committees reviewed the curriculum used in primary schools and the task force met several times to draft a test instrument. The instrument was field tested among different categories of primary school aged children such as, boys-girls, urban-rural, poor-rich, formal-nonformal, schooler-nonschooler etc. Through trial and error in different ways the task force developed a valid and reliable instrument to measure the level of basic education of the Bangladeshi children (Chowdhury et al, 1992). The committees reviewed the World Declaration and the definition of 'basic education' recommended by the World Conference on Education for All (WCEFA, 1990) and accepted the following definition of basic education for Bangladesh:

"Basic education will refer to education intended to develop basic learning skills (i.e., 3 R's) as well as some basic life skills necessary for the children to survive, to improve the quality of their lives and to continue learning" (Chowdhury et al, 1992: 9)

Given the above definition, the following competencies were considered in developing an assessment instrument:

- a) ability to read and write a short, simple statement on everyday life;
- b) ability to work out everyday arithmetic;
- c) knowledge/attitude regarding selected life skills necessary to improve quality of life.

Based on the above principles, the instrument included four sections: life skills/knowledge, reading, writing and numeracy. A variety of questions were set for each section and the number of total items was 46. The first national survey was conducted with this instrument in 1992. In January 1993, one study was undertaken to understand parents' views on what life skills their children should know (Nath, Mohsin & Chowdhury, 1993a). According to the results of this study some changes were done in the life skills part of the instrument. In the light of the 1992 national survey results 4 questions were dropped from the reading and writing skills parts. The modified instrument used in the 1993 national survey was as follows with a total of 42 items (Nath, Mohsin & Chowdhury, 1993b). An English version of the assessment instrument is given in Appendix I. For details on the design and its modification see: Chowdhury et al., 1994 & 1992, Nath et al., 1993b.

1.8 Findings from education research in Bangladesh

1.8.1 Studies on enrolment and literacy

Research on Bangladesh education is very limited. The country still faces problems with the enrolment of all children in the educational process and there is a significant

gender gap in enrolment (Nath, 1997). Furthermore, management and supervision of education programmes is unsatisfactory. This means that the country is still facing problems with input and process factors, and few studies have been done on these issues. Studies on school enrolment show that net enrolment rate in rural Bangladesh is less than 75% (Nath, 1997; Hadi, 1995). These studies also explored the relationship between enrolment and socio-economic factors. Quader & Ahmed (1980) showed that household income has a marginal effect on enrolment at the low-income level, which increases at higher levels. They also reported that land holding of the household also loosens its effect as the amount of land increases. Some studies have identified the relationship between enrolment and fathers' occupation. Children of the fathers with salaried jobs and business men were found more likely to be enrolled in schools than the children of labours (Hadi, 1995; Haque et al., 1983; Ahmed & Hassan, 1984). Haque et al., (1985) concluded that the economic and cultural context as well as the availability and quality of services are positively associated with the enrolment status in rural Bangladesh. Hadi (1995) observed that gender variation narrows if development intervention is correctly tailored and implemented. This study also observed that children of religious minorities were significantly less likely to be enrolled in schools.

After finishing three years curriculum in BRAC schools the children continue their education in the formal schools. Studies showed that of the children who completed the BRAC school curriculum in 1990, 69% and 53% of them were found in formal schools respectively in 1992 and 1994 (Nath, Khan & Chowdhury, 1994). Among the children who completed the BRAC school curriculum in early 1995, about 80% of them were found enrolled in formal schools when surveyed ten months after their

graduation from BRAC schools. This study also observed that there was no gender variation in formal school enrolment of BRAC graduates. Children who were younger in age and whose mothers had some schooling were more likely to be enrolled in formal schools (Nath, 1996).

By whatever criteria of measurement, literacy levels have never been high in Bangladesh (Bangladesh Bureau of Statistics, 1994). Moreover it should be noted that current census definition of literacy is very simple one; if one can read and write a communication letter, he/she is considered as literate. The current literacy rate of the country is 24.6% for all ages and 32.4% for those aged seven years and above (Bangladesh Bureau of Statistics, 1994). The decennial censuses showed that the literacy situation increased at a lower rate (21.5% in 1961 to 27.8% in 1991) for persons five years and above (Bangladesh Bureau of Education Information and Statistics, 1992). On aggregate women lag far behind men and the rural population lag far behind the urban population in their level of literacy (Bangladesh Bureau of Statistics, 1994). About 85% of the rural women are functionally illiterate (UNESCO, 1989).

1.8.2 Studies on basic education

As a continuation of the development of methodology and the measurement instrument, the first survey on basic education was held in 1992 (Chowdhury et al., 1992). This study was conducted among the children beyond the official primary school age 6-10 years. Irrespective of whether the children went to school or not, this study took all children aged 11-12 years as its target population. One of the

objectives of this study was to have a benchmark of level of basic education for Bangladesh. This study found that only 25% of the interviewed children satisfied the criteria of basic education. In general, boys performed better than girls did, though girls did slightly better than boys in three rural divisions, which were Dhaka, Chittagong and Khulna. On the other hand, boys of rural Rajshahi division and the urban areas performed much better than girls. Divisional analysis showed that the children of Khulna division did best (29.5%) while Chittagong did worst (16.7%) (Chowdhury et al., 1992).

Following the 1992 study another nation wide study was conducted in February 1993 with the same purpose. The study population was also the same as previous one (Nath et al., 1993b). This study found that level of basic education increased only 1.7 percentage points over the period of one year. Like the previous one, this study estimated the levels of basic education by gender and region. Another sub national study was conducted with the similar purpose (Murshid & Ali, 1994).

Secondary analysis of the second national survey data showed the relationship of basic education with different socio-economic factors (Mohsin, Nath & Chowdhury, 1996). Using multivariate regression analysis this study observed that residence of the children, years of schooling possessed by them, parental level of education, and economic status of the households were the most influential determinants of achieving basic education. Urban-rural differentiation in the achievement was also highlighted in one study (Mohsin, Nath & Chowdhury, 1994). This study showed that the level of basic education was higher among the urban children (55.7%) than their rural counterparts (23.4%). Examining this difference with some selected socio-economic

variables this study concluded that urban-rural difference was happening irrespective of sex and years of schooling of the children, parental level of education and the economic status of the household. Inadequate educational investment and the absence of quality teaching in rural areas were suggested to be the causes of this differentiation.

Some studies were also conducted to understand the existing level of basic education of the graduates (children completed three years curriculum) of BRAC's non-formal education programme. The first of these was conducted in 1992, where 200 children who were graduated in 1990 were assessed. This study found that 55.5% of the interviewed children had achieved a basic level of education (Nath, Mohsin & Chowdhury, 1992). Attempts were made to re-interview all of these graduates in 1994, and 169 were traced. A follow-up study of these 169 children in 1994 showed that 69.2% of the sample had satisfied basic education criteria, whereas their achievement level was 56.2% in 1992 (Nath et al., 1994). This 1994 study also interviewed a new cohort of 200 graduates who completed BRAC school course in 1992. Among these graduates, 59% could satisfy basic education criteria. All these above findings indicate that level of basic education of the BRAC school graduates was increasing over time.

Another recent study was conducted on a recent cohort of BRAC school graduates (graduated in early 1995). In this study the children were assessed 10 months after their graduation (Nath et al., 1996). This study showed that on average, 73.8% of the respondents satisfied the criteria of basic education. Girls performed better than boys (74.3% vs. 72.6%) however, no significant difference was found. This study also

identified that graduates who were currently in school, whose fathers had some schooling, whose households had more than 50 decimals of land and those who had access to television were more likely to have basic education than other groups of respondents (Nath & Chowdhury, 1996).

1.9 Rationale of the study

The World Declaration on Education for All emphasised the need for strong co-operation between government and non-government organisations to achieve the WCEFA goals (WCEFA, 1990). In its National Plan of Action for Education for All, the government of Bangladesh re-iterated that it is not possible for the government alone to achieve national goals towards basic education and universalising of primary education (Primary and Mass Education Division, 1995). Alam et al., (1996) also suggested that non-formal education programme of the NGOs could play significant role in implementing UPE in Bangladesh.

Due to the incomplete nature of the formal education system it is not possible to offer space to all the children in government schools (Brock et al., 1991), and poor quality of management and supervision of formal schools made the system ineffective. The dropout rate of the formal education system is also very high compared to non-formal education system. Ahmad et al., (1991) saw that it was difficult to bring everyone within the net of formal schooling system and suggested that NGOs are ideally suited to carry out non-formal education programme. According to Ahmed et al., (1993) the Universal Primary Education (UPE) can not be achieved in the short run merely by increasing the number of formal schools. On the other hand, BRAC has experience in

operating the largest non-formal education programme in the country. Compared to the formal education sector this programme is still small but it is already building an articulate approach to non-formal primary education (Ahmed et al., 1993) and this programme has already proved itself effective for rural Bangladeshi children. Its management and supervision system and community level participation ensures effective education for the pupils. Cost effectiveness of the programme indicated that this approach can be implemented at a large scale for the benefit of the poor communities. Bangladesh has not much time to wait. Therefore it is necessary to take initiative to spread those types of schools which are very much helpful to achieve national educational goals.

Many studies have been conducted to understand the management and supervision, cost-effectiveness, dropout rate, community participation of BRAC's non-formal education programme compared to the formal education sector. But no independent study has been undertaken to compare the output (i.e., performance of the learners) between these two types of schools. A study was undertaken in 1991 to see how the BRAC school graduates perform in the formal schools compared to their formal school peers. This study showed that former BRAC students performed marginally better in English and Bengali, and the formal school students performed marginally better in Mathematics and Social Studies (Khan & Chowdhury, 1991). As a signatory to the World Declaration on Education for All, Bangladesh is required to impart basic education at least 80% of the school aged children by 2000 AD. So it is important to look at the contribution of BRAC's education programme on raising basic education level for the children in the light of World Declaration.

It was observed that studies on basic education did not compare the level of basic education of the BRAC school pupils with formal school learners (Chowdhury et al., 1992; Nath et al., 1993b). The national studies failed to do this because compared to the national sample, the sample of BRAC pupils was so small that no meaningful comparison was possible. The studies conducted to understand the level of basic education of the BRAC school graduates did not consider formal school learners because they lay outside the study's remit (Nath et al., 1996, 1994, 1992). However, the results of these separate studies suggested that performance of BRAC school learners might be higher than that of formal school learners.

This study has been initiated to examine this suggestion. As BRAC schools are mostly located in rural areas this initiative was taken only in rural areas. It is expected that the results of this study will help to understand the quality of output of the formal primary schools and the BRAC's non-formal primary schools. This information will help policy makers and international donor communities to take decisions about which model might be appropriate for rural Bangladesh to adopt in order to achieve the national goal towards quality education.

1.10 Aims of the research

The broad aim of this study is to explore the impact of BRAC's non-formal education programme on the basic educational achievement of the children of rural Bangladesh. To understand the real impact of BRAC programme the performance of the children of formal school and never-schooled children were also assessed along with the BRAC school children. These performances were estimated by controlling for

necessary background characteristics of the children. This study also aims to examine the impact of BRAC on the different components of basic education, these are: life skills, reading, writing and numeracy.

1.11 Hypotheses

Following are the specific hypotheses of this study presented in either the positive or the null forms.

Hypothesis 1: The children of BRAC schools are more likely to have achieved higher basic educational status compared to the children of formal school and never-schooled children.

Subsidiary hypotheses formulated for the different components of basic education are:

Hypothesis 2: NFPE children are more likely to do better in achieving life skills knowledge than their peers in formal school and never-schooled children.

Hypothesis 3: The children who have experienced non-formal school are more likely to have better reading skills than those who have experienced formal school or never went to school.

Hypothesis 4: The children of BRAC's NFPE are more likely to do better in writing skills than their peers in formal school and non-schooled children.

Hypothesis 5: It is more likely that BRAC children will do better in numeracy than never schooled children. However, there might not be any difference between formal and non-formal children.

1.11.1 Justification for the hypotheses

Following are some of the explanations to justify the hypotheses made to test in this study. It should be mentioned that findings of the previous studies were considered to justify the hypotheses. It is already stated in the rationale section that no firm conclusions could be drawn from previous research--- hence the current study.

Hypothesis 1: Of the four components of basic education two viz., reading and writing, are highly related to school experience and so there is little possibility to find basic education amongst never-schooled children.

The teaching system in BRAC schools is much more learner-centred, whereas, it is teacher-centred in formal schools. Group work is seldom practised in formal schools and homework is substantial. On the other hand, there is no or very little home work in BRAC schools, and group work is promoted in the classroom (Chowdhury et al., 1996). These are some examples of difference in the teaching/learning process in the two systems. It is thought that this learner-centred teaching system provides quality education in BRAC schools, and that this may lead to better level of basic education among BRAC school graduates compared to formal school students.

Mohsin et al., (1996) showed the that level of basic education was 15.7% among the children who completed three year of schooling, and gradually increased according to years of schooling increased and rising to 60.7% among those completed 6+ years of schooling. On the other hand, Nath et al., (1996) observed

that 73.8% of the interviewed children satisfied all criteria of basic education, when interviewed 10 months after their graduation from BRAC schools. Though these are separate studies and very few BRAC learners are included with the former estimates, they give some indication that BRAC graduates may have better performance in achieving basic education than the other groups of children included in the study.

Hypotheses 2 to 5: Basic education is a combination of four components. Of these four, life skills and the numeracy skills can be achieved by some of the children from the society in which s/he lives, without going to any school. Therefore it is possible for never-schooled children to have some level of life skills and numeracy skills. But it is very rare for them to satisfy the additional criteria of reading and writing skills. As an earlier study (Mohsin et al., 1996) indicated that years of schooling has a very strong correlation with different components of basic education, it is unlikely that the never-schooled children will overcome the children of other two groups. Again, comparing Nath et al., (1996) and Mohsin et al., (1996) it can be said that the possibility of having better levels in life skills, reading and writing skills is higher for the BRAC school graduates compared to formal school learners. But in numeracy skills there may be little difference between these two groups.

Thus it can be suggested that the impact of BRAC's education programme will be evident in basic education and as well as three of its components: life skills, reading and writing, but not in numeracy.

Chapter Two: Research Strategy

This chapter describes evaluation as one strategy for educational research. At the beginning of the chapter the concept of evaluative research and its relevance to educational research are presented, followed by different categories of evaluative research. Next two sections deal with two different types of evaluative research such as the process evaluation study and the impact assessment study. Two approaches to impact assessment are presented: randomised and non-randomised experimental designs.

2.1 Evaluative research

Evaluation is a vital component of almost any programme that wishes to achieve a standard quality and wants to remain effective. It acts as the watchdog of efficiency in the planning and implementation stages of any programme. It can also be guarantor of effectiveness in the programme's end results. More specifically, evaluation is a systematic application of social research procedures which assesses the conceptualisation, design, implementation and utility of an intervention programme. Evaluation can be considered as a process where an attempt is made to assess the relevance, effectiveness and impact of an intervention, usually in the light of its objectives (Chinapah & Miron, 1990). In evaluation research the researcher uses the theories, techniques and concepts of several related disciplines (Rosi & Freeman, 1989). Evaluation activity is not new; it has a history of thousands of years. However, evaluation as it is practised today is less than a century old (Guba & Lincoln, 1981). A great change as well as growth has been occurred in the field of

evaluation from the beginning of 1960's. Many of these attempts have been taken because of the continuing efforts to promote progressive changes in the society with successively more efficient and more effective programme planning (Chinapah et al., 1990). The 'evaluation research lobby' which includes legislators, planners, programme managers and foundation executives have also been an active force behind the growth and application of evaluation (Norish, 1990; Berk and Rossi, 1976). Educational evaluation as a branch of the social sciences started in the USA and in Britain in the early twentieth century (Norish, 1990)

In order to justify society's continued support social institutions require providing 'proof' of their legitimacy and effectiveness. These institutions may be educational, economic, religious, political or medical. Today, people are showing increased interest in community matters and they are trying to influence the determination of public policy. Suchman mentioned three major changes, which reinforce each other to produce growing demand for evaluative research. These are: changes in the nature of social problems, changes in the structure and function of public agencies, and changes in the needs and expectations of the public (Suchman, 1967).

In any evaluation, careful consideration of many basic questions is required. The researcher needs to be aware of the assumptions under which evaluation operates, and also to formulate the purposes and goals of the evaluation study. The methodology for evaluative research should be chosen carefully, this requires a deep understanding of recent developments in social science research. The valid interpretation and successful application of findings is vital for any evaluative research. Without careful consideration of above these methodological issues any evaluation study may mislead

the audience. There is also a distinction between 'evaluation' and 'evaluative research'. 'Evaluation' can be used in a "general way as referring to the social process of making judgements of worth". 'Evaluative research', on the other hand, is "restricted to the utilisation of (social) scientific research methods and techniques for the purpose of making an evaluation" (Suchman, 1967: 7, parenthesis added by author).

Conceptually as well as methodologically, the evaluation of an educational programme is often limited to a given phase of a cyclical or chronological process. This type of evaluation is therefore commonly described as an activity which assesses the success or failure of the planned objectives of an educational programme after it has been implemented but not before or during implementation (Chinaph and Fagerlind, 1986). Evaluation of this type is often known as 'product evaluation' or 'outcome evaluation' (Chinaph et al., 1990). This can be distinguished from 'formative' evaluation which aims to provide information during the course of a programme to enable those implementing it to improve their provision.

In the broader spectrum of human resource development, the evaluation research is closely associated with purposeful and organised social intervention programmes. According to Fagerlind and Saha (1983), the relationship between education and society is dialectic one where education is a part of this dialectical process. This relationship works according to the economic, social, and political dimensions of a society. They also added that the dialectical process assumes that education is a product of society, then acts on society by bringing about changes, and finally acts again on the education system. Thus, it is important to recognise that in evaluating

educational programmes, the evaluator should use data from the various different dimensions of the social settings in addition to the required educational data (Chinaph et al., 1990). The targeted population of educational programmes is often heterogeneous by nature and thus their needs, interests and expectations are rarely uni-dimensional. Without proper understanding of these dimensions (human factors or human purposes) it is difficult to evaluate an educational programme. Again, any one educational programme would be much more specific compared to the larger dimension of the educational policies of a country. However, it is important to investigate programmes within the framework of policies both global as well as country specific. Chinaph and Fagerlind (1986) argued that "it is practically impossible to evaluate educational policies without having systematically organised them" through policy analysis methods (cited in Chinaph et al., 1990: 36).

Thus educational evaluation can be considered as a process of analysis and control designed to determine the relevance, effectiveness, significance, and impact of specific educational activities and the degree of efficiency with which the programme is carried out. It is sometimes called a political activity and often now considered as an essential part of everyday activities of education managers. In addition it is part of a large stream of activities which lead to educational policy making and effective planning of education programmes. It can also document the impact and cost-effectiveness of a programme.

2.2 Types of evaluative research

There are several types of evaluative research. These represent different criteria of success or failure according to which a programme may be evaluated. The 'category fit' for any programme evaluation depends on the objectives of the programme and as well as the objectives of the evaluation. Paul (1956) mentioned three major set of criteria, 1) assessment of effort, which deals with the energy and action served by the programme personnel; 2) assessment of effects, which are the results of the efforts, rather than the effort itself; 3) assessment of process, which requires an analysis of why and how an effect was achieved.

Suchman (1967) has proposed five categories of criteria according to which the success or failure of a programme may be evaluated. These are, 1) Effort, 2) Performance, 3) Adequacy of performance, 4) Efficiency, and 5) Process. These categories are interrelated, for instance, an evaluation of effort and performance necessarily preceding one of adequacy, efficiency or process. Moreover, in general, successful performance implies successful effort, although such performance may be inadequate in terms of the total problem being faced by the society. The effect of any effort may also be inefficient as compared to some alternative methods.

On the other hand, Chinapah et al., (1990) put forward three different types of evaluation, these are: process evaluation, impact evaluation and holistic evaluation.

Process evaluation: A process evaluation is concerned with the manner, and sometimes the values, in which a programme is implemented following the stated

guidelines and design. This type of evaluation is often referred to as a 'formative' evaluation.

Impact evaluation: An impact evaluation is concerned with measuring the extent to which a programme produces the expected change among the target population. This type of evaluation is often referred to as 'outcome' or 'summative' evaluation.

'Holistic' evaluation: What Chinapah et al., calls, a holistic approach to evaluation is a combination of both the process and the impact evaluation. To have a better understanding of an intervention it is better for evaluations to include both types as they complement and support each other. But due to budgetary constraints or the inadequacy of planning, this is not always possible.

2.3 Process evaluation study

The process evaluation studies are thought to provide a better understanding of on-going processes of any programme. This type of evaluation is helpful early in programme development and as well as later on when improving the programme is necessary. Process evaluation will help any programme to achieve its content objective and numeric targets. A process evaluation is often concerned with whether or not the programme is implemented for the intended target population. It is the purpose of a process evaluation to pinpoint the problems that can hinder effective implementation of the programme. These include whether or not staff and necessary equipment are available, whether there is any political forces to prevent their allocation, whether the staff had been adequately trained, etc. This evaluation also looks at whether the programme staff are sufficiently motivated for their assigned

duties. It also examines the degree to which the target population is identified and served (Chinapah et al., 1990).

An evaluation study which is concerned with a programme's implementation and how to improve its operation towards effectiveness would need to observe the programme in its operation phase. A post programme evaluation can't provide any realistic recommendations in this issue. Cronbach et al., (1980) claimed that process evaluation is more important than impact evaluation. In this respect they urge that evaluation should be employed to improve a programme; if it is done at the end of the programme, it is of less practical usefulness (cited in Lewy, 1985). Process evaluation can be undertaken on a single programme or on two or more programmes. If the processes of more than one programme are evaluated to see the comparative strength or weakness among them, care should be taken that similar indicators are selected to assess each programme. Chinapah et al., (1990) suggests that process evaluation needs more theoretical and methodological works to be done in order to develop a uniform method and theory for assessing programme implementation.

Process evaluation has a significant place in educational development. Providing feedback to the teachers and the students is an essential part of any teaching-learning process. It is possible through process evaluation to identify the weak points of the teaching-learning process and also to identify poor students who need special teaching (Lewy, 1985). This evaluation procedure is also helpful to analyse whether teacher behaviour or the classroom environment creates any discrimination among the learners. In this respect classroom observation techniques have been recognised as an effective research method. In addition to direct observation, some other

supplementary techniques such as student inventories, teacher self-assessment and interviewing might be useful (Harris, 1985). Some characteristics of a process evaluation are: it focuses on relatively molecular analysis, it seeks to explain cause, is directed to the programme participants, and encompasses in the broader experiences of the programme users (Lewy, 1985). Moreover, process evaluation can provide prompt and useful feedback to the programme.

2.4 Impact assessment study

Impact assessment studies are undertaken to understand whether or not programme interventions produce their intended effects. An impact evaluation does not necessarily need to assess the process of implementation of a programme. This type of evaluation requires a set of operationalised objectives to be used as criteria for measuring success. More important is that an impact evaluation has little meaning without relevant qualitative as well as quantitative data to assess the extent of an intervention's effectiveness. Thus experimental designs are useful in impact evaluation studies but often they fail to give an adequate explanation of process especially if they rely on a restricted set of easily measured outcomes (Chinapah et al., 1990).

The design of impact assessments needs to take into account two competing pressures. It should be undertaken in such a way that firm conclusions can be reached. Again, practical considerations of time, money, co-operation, and protection of human participants are essential which might limit the design options and methodological procedures. In impact assessment study the researcher tries to assess

the outcomes of social programmes by comparing similar information about participants and non-participants. Sometimes, repeated measurements on participants are taken, the most common practice is to assess before and after a programme intervention. The principal aim of an impact study is to produce an estimate of the 'net effect' of a programme intervention. This means that the researcher seeks to have an estimate of the impact of the intervention which is uncontaminated by the influence of other processes and events that may affect the programme performance (Rosi et al., 1989).

In measuring impact by itself, it is difficult for evaluation researchers to pass judgement on the approved criteria if these were adjusted in implementation or during fine-tuning. Furthermore, an evaluation study can't judge a programme to be successful just because it was implemented according to its design. It is necessary to identify whether or not the objectives of a programme were met, whether or not the programme had an impact and so, whether or not it was a positive impact (Chinapah et al., 1990).

The impact of a programme can be evaluated throughout the life course of the programme. First, at the pilot stage evaluation can be done to find out how likely it is that proposed programme will have its intended impact. Second, in the design stage, impact evaluation may be undertaken to find the most effective ways to develop and integrate the various elements of the programme. Third, after putting the programme in place, generally in a limited number of sites, assessment can be made to gauge its operational effectiveness, in other words, to know the possibility for implementation in a large number of sites. Fourth, sometimes programme needs modification at its

implementation phase. To understand the effective way of modifications, impact evaluation may be helpful. Finally, impact assessment can be done on an ongoing project at the end of its different phases (Rosi et al., 1989).

There is a danger that impact evaluation studies often do not consider many of the factors that are external to the actual programme and which may account for some or all of the unforeseen outcomes. Again, many of the impact evaluation designs fail to distinguish between external and actual influences. Ideally, an impact evaluation should be able to measure change due to the programme implementation ruling out other possible factors, which might have affected the change. Further, an impact evaluation should be able to identify under what conditions a programme is most effective (Chinapah et al., 1990).

2.4.1 Randomised experiment design

Randomised experiments are the ideal procedure to evaluate a programme's performance because they allow stronger causal conclusions to be drawn. However, experiments are sometimes unethical because individuals wish to exercise choice. Many experiments are based on comparisons between target groups in the population. These groups are randomly assigned either to experience some programme intervention or to be left out side the intervention. In ideal experimental designs, the effect of the intervention being evaluated is isolated by ensuring that the experimental and the control groups are exactly comparable at outset; then the experimental group gets some type of intervention. However, strictly comparable groups are not always possible in social science research. In practice it is considered sufficient if groups are

alike at aggregate level with respect to any characteristics that could be relevant to the programme outcome (Rosi et al., 1990). It should be mentioned that no two individuals, households or units are exactly comparable in all respects. So complete one-to-one comparability is not possible in social science. It is only necessary to ensure that experimental and control groups are identical in aggregate terms and in respects that are relevant to the intended effects of the programme evaluated. The best way to achieve comparability between experimental and control groups is to randomly select members of a target population to the two groups. This can be done by allowing chance to decide whether or not a person or any other unit is offered a programme intervention (Rosi et al., 1990). It is vitally important to ensure that every unit in a target population has the equal chance to be selected for either the intervention or control group (Fisher, 1935; Riecken and Boruch, 1974).

In this design, to ensure comparability of experimental and control groups, extraneous factors are equally distributed across the groups. Although stochastic effects may create some difference between any two groups, statistical procedures enable an estimate of the likelihood that observed differences are due to chance or to the intervention being studied. In a true experiment, the estimated net effect of an intervention can be expressed as the experimental group's score on a post intervention measure minus the control group's score, plus or minus stochastic effects (Rosi et al., 1990) i.e.,

$$\text{Net effect} = \text{Gross outcome for an experimental group} - \text{Gross outcome for a comparable control group} \pm \text{Design effects and stochastic error}$$

In impact assessment studies, sometimes measures are taken before and during an intervention, as well as repeated measurements afterwards. This increases measurement reliability and the precision of estimates of net effects. In this strategy, the researcher is able to reconstruct how the intervention worked over time. But the repeated tests in educational research may threaten the validity of measurement (Cohen and Manion, 1994).

Despite its power, randomised experiments has several limitations too when applied to the evaluation of social programmes. a) they may not be useful in the early stages of programme implementation, when interventions may change in ways not allowed for the experiment. b) Randomisation is sometimes unfair and even unethical because differential treatment are given to experimental and control groups. c) The way in which treatment is delivered in the experimental condition may not resemble treatment delivery in the implemented programme. d) Experiments are costly and time consuming. e) As experiments require tight control, the generalisability and external validity may also be low. f) This design is applicable only to partial coverage programmes, in which there are sufficient untreated targets from which comparison may be drawn (Rosi et al., 1989).

2.4.2 Non-randomised experiment design

In situations where randomised experimental designs are not possible to apply, non-random experimental designs are applicable. Education is one of those social science fields in which this often applies because it is not possible for investigators to undertake randomised experiments (Cohen et al., 1994). There are three evaluation

strategies suggested by Rosi et al., (1990) which are used when it is not possible to randomise the target population into experimental and comparison or control groups. These are, quasi-experimental, reflexive control and shadow control. The quasi-experimental design makes use of non-equivalent comparison groups. Kerlinger (1970) refers to quasi-experimental situations as 'compromise design'. The reflexive control design is based on multiple measures on targets taken before and after the programme is in operation. In shadow control judgement is made to assess the impact of any programme.

As in random experiments, the constructed controls (i.e., selected in a non-random way) are used only when there is partial programme coverage. Constructed controls can be used in full coverage programmes when variation exists in the intensity with which the intervention is delivered to the targets. The quasi-experimental designs are powerful solutions when randomisation is not possible and they should be designed prior to the implementation of a programme. Full coverage programmes generally are evaluated by using reflexive controls. In reflexive controls comparison is made between pre-programme and post-programme outcome measurements. Designs of this type range from simple before/after test to time series evaluations. In before/after evaluation there is only one measurement before and one after programme implementation. However, in time series evaluations there are multiple measurements when the intervention is in place. Obviously, time series designs are much more powerful than simple before/after designs in estimating net effects of any programme intervention. If only two measurements are taken to evaluate any programme, it is difficult to differentiate net from gross effects. Shadow control evaluations make use of judges to estimate programme impact. These judges may be experts in the

respective programme area, or programme estimators or the target people themselves. Although such evaluations are fairly common, it is not possible to estimate net effects from them (Rosi et al., 1990).

A table for classification of impact assessment research designs, provided by Rosi et al., (1989: 254) in their book *Evaluation: A Systematic Approach*, is shown in Table 2.1

Table 2.1: A typology of research designs for impact assessment.

Research designs	Intervention assessment	Type of controls used	Data collection strategies
I. Designs for partial- coverage programmes			
A. Randomised or 'true' experiments	Random assignment controlled by researcher	Experimental and control groups randomly selected	Minimum data needed are after intervention measures; typically consist of before, during and after measure
B. Quasi-experiments	Non-random, but fixed and known to researcher	Selected targets compared to unselected targets, holding selection control	Typically consists of multiple before and after intervention output measure
1) Regression-discontinuity			
2) Matched controls	Non-random and unknown	Intervention group matched with controls selected by researcher	Typically consists of before and after intervention measure
3) Statistically equated controls	Non-random and after non-uniform	Exposed and unexposed targets compared by means of statistical controls	Before- after or after- only intervention output measure and control variables
4) Generic controls	Non-random	Exposed target compared to output measures available on population	After intervention output measures on targets plus publicly available 'norms' of output levels in population
II. Designs for full- coverage programmes*			
A. Simple before- after studies	Non-random and uniform	Targets measured before and after intervention	Output measured on exposed targets before and after intervention
B. Cross sectional studies for non-uniform programmes	Non-random and non-uniform	Targets differentially exposed to intervention compared with statistical control	After intervention output measure and control variable
C. Panel studies: several repeated measures for non-uniform programmes	Non-random and non-uniform	Targets measured before, during and after intervention	Repeated measures taken of exposure to intervention and of output
D. Time series: many repeated measure	Non-random and uniform	Large aggregate compared before and after intervention	Many repeated output measures before and after intervention of large aggregates

* Many of these designs are also used for impact assessment of partial coverage programmes
Source: Rosi PH and Freeman (1989): Evaluation: A Systematic Approach, Fourth edition, California, Sage Publications, Inc.

Chapter Three: Methodology

The research reported in this dissertation falls in the 'summative' or 'impact' category. In designing the methodology for this study it was considered that the process of the educational programmes (both formal and non-formal) are already documented (Chowdhury et al., 1996; Alam et al., 1996; BRAC, 1994). It is recognised that both 'formative' and 'summative' approaches could complement each other in this research.

The methodology of the impact assessment study is presented in this chapter. The design of the study was not true experimental, but quasi-experimental with statistically equated control. The following sections describe the study population, sampling, field operations, ethical considerations and data analytic techniques. Reliability of the data and validity of the instrument is also assessed in this chapter. Finally, the strengths and weaknesses of the research are discussed.

It should be mentioned that the data collection was carried out in the period between acceptance on the degree and start of the Oxford course. The author designed the research for this dissertation using the instrument designed for the national survey of basic education on which he was a team member. Research questions were initially formulated in Bangladesh, and refined and supplemented during the MSc course. Strategies for analysis were designed during the course itself. In addition, the conceptual/ critical framework for evaluation research was broadened and deepened through the MSc studies.

3.1 Study area and population

The Research and Evaluation Division of BRAC operates an intensive monitoring system, known as *Watch*, in 10 rural areas of Bangladesh. The system was introduced to document changes in rural lives induced by BRAC's development programmes, which includes health, income generation, education and women's projects. Taking about 1,000 households in each area, the system covers nearly 10,000 households with over 50,000 population in 70 villages. To update the data, birth, death, migration and marriages have been recorded every month on all population under the surveillance areas and preserved on computer. The sampling frame of this surveillance system was used for this study.

Three groups of children were considered as subjects for this study. These are BRAC school graduates, children who had completed at least three years curriculum in formal schools and children who had never attended school. Of the above 10 areas, only five areas were found where BRAC's education programme had completed at least one cycle in 1995 or 1996. These were Manikganj, Jamalpur, Jessore, Cox-s-Bazer and Kishorganj. It is to be noted that children graduated from BRAC's BEOC programme was not considered for this study because the age of these graduates was higher than the NFPE graduates, making them unsuitable for the assessment instrument. The NFPE graduates who were graduated before 1995 were also excluded from the study population for the same reason.

Thus the first group of study population was those children who graduated from BRAC's Non Formal Primary Education (NFPE) programme during 1995 and 1996. A full list of these graduates was produced from the study area. Matching this list

with the population data file it was found that these graduates were aged from 10 to 16 years. A list of children aged 10-16 years and with at least 3 years of formal schooling was also produced from the data file. These are the second group of study population. Similarly, another list of children with similar age group and no schooling was produced to provide the third group of study population.

3.2 Sampling

Like all previous surveys on basic education, this study considered the achievement of basic education as a dichotomous variable, i. e., each individual in the sample either had or had not attained it. The formula for estimating sample size, when the dependent variable is dichotomous, is as follows (Cochran, 1977; Kalton, 1983):

$$n = \frac{z^2 pq}{d^2}$$

Where, n is the estimated sample size, z is the area of standard normal curve under certain confidence limit, p is the proportion of children having basic education, q = 1-p, and d is the level of precision.

It was estimated that a sample of at least 96 children is necessary to have a single estimate for a precision level of 10% and 95% confidence limit. Due to limitation in the size of the population a smaller level of precision (say, 5%) could not be considered. This study attempted to have separate estimates for boys and girls of each of the study groups. Instead of the calculated minimum sample size of 96, 120 children from each of the groups were finally selected, bringing the total sample size

to 720 (120 x 2 x 3) for the whole study. The samples (separately for each of the six groups) were selected through computer by using simple random procedure.

3.3 Interviewers and their training

Ten male field researchers who had been working in the *Watch* project for several years were selected as interviewers for this study. One senior field researcher was selected to supervise the whole activity of data collection. Most of these 11 persons had previous experience in carrying out educational study. A three-day training workshop of the interviewers and the supervisor was held at BRAC's head office at Dhaka. This included classroom discussion, role play exercise and field operation. A detailed instruction manual was also used in the workshop. The training sessions were conducted by the author of this dissertation.

3.4 The questionnaire

A structured questionnaire, which had been used in the recent national survey on basic education, was used in this study. The questionnaire had two parts. The first contained the test items, which were filled in by examining the children, and the second was background information provided by interviewing their parents/guardians. A two-page exercise book was also attached with the questionnaire for children to complete written items of the test. Necessary stationery such as pencil, eraser, pencil sharpener, clipboard etc. was also provided. The language of the questionnaire was Bangla, although an English version of the questionnaire is presented in Appendix I.

3.5 Data collection

The data were collected by a team of two field researchers who interviewed the randomly selected children and their parents/guardians at their residence. While one of the team members conducted the actual interview, the other kept the crowd and onlookers (children and adults) away. This ensured a smooth and undisturbed interview. These two persons alternatively did these activities. These field researchers visit each of these households once a month and consequently were familiar to the respondent children and their parents. Care was taken to ensure that the interviewee child did not get nervous as a result of the behaviour of the interviewer or the onlookers. Because interviewing adults is very common in Bangladesh whereas it is rare for the children. The interviews took place either inside own houses of the children or in their courtyard. After finishing one interview the team members carefully checked the completed questionnaire to ensure that all the questions had been asked. Then they moved to the house of the next selected children. If any selected child or/and his/her parent was found absent the team attempted to conduct the interview on the following day. If they were found busy with household activities, a more convenient interview time was fixed. When such a problem arose the team took two more attempts to conduct the interview. If these failed, the respondent was omitted from the sample. These dropped respondents were replaced by taking randomly from the rest of the population.

Five teams of interviewers worked in five areas, and a similar strategy was followed in each area to conduct the interviews. The duty of the supervisor was to carry out random visits to the teams while they were working to ensure that the team

interviewed the right children (as selected earlier by the author) and conducted the interviews as instructed. Such random visits were also carried out by the author to see the overall activity of data collection. The whole activity of preparation and field operations took two months, August and September 1996.

3.6 Ethics in the field and beyond

In earlier years ethical considerations in educational research has received less attention than technical standards. Awareness of ethical issues has started to increase since the early 1970's. Ethical questions are related to the subjects of the study, to the 'customers' for a particular research, to the scientific community and to society in general (Dockrell, 1985). However, considering the key concepts and ideas on ethical issues of all domains of social sciences research it is difficult to adjudicate on what should be 'correct' behaviour for education researchers (Cohen et al., 1994)

In general, interviewing children is a rare event in Bangladesh. When the interviewers entered a house of a selected child they described the purpose of their visit to the parent. It was not a problem to talk with the parents (both male and female) because these interviewers visit families once a month to update the population data files of the surveillance area. Again, these same interviewers talked with these adult persons on different occasions to collect data for many other studies. However, in some cases due to purdah system the women refused to talk with the male interviewers. In these cases interviewing was delayed till the male person was available. In contrast, the objective of the researcher to interview the children led to much curiosity among the parents. Some of them said, "Oh! Why do you want to

interview them, they are very young, what do they know” etc. Parents were then informed that some educational/ knowledge related issues would be asked to the children. All showed their interest in it and felt that it was important to examine their children’s educational performance. Some of the parents also wanted to know how well their children did in the test. In such cases the interviewer indirectly replied that “Not bad, but it needs more attention to education”. Sometimes the parents as well as the children were curious about the performance of the other children. No information was given to anybody due to the confidentiality of the data. On the other hand, the situation with the never-schooled children was slightly different compared to formal and non-formal groups. Here it took more time to convince the parents as well as the children that the tests were important. It may be those parents felt it irrelevant to see the educational level of the non-schooled children. Again, they were feeling self-conscious as these children do not go to school and so they feared that they would not be able to answer correctly. When the interviewers described that it is possible to have basic knowledge without schooling and we all learn something from the social institution and everyday life, then the most parents agreed to participate in the interview. All interviews were conducted after giving a great deal of information to the families about the purpose of the study.

There is a problem in interviewing the adolescent girls by male interviewer. In the national survey on basic education help was taken from an elderly women (who was selected from the same village and with the help of the village leader) to overcome this problem. Again, it is also culturally unacceptable in rural Bangladesh for males and females to travel together. This problem of interviewing was less frequent in the

present research because these girls knew the interviewers. If such problem arose, the mothers of the children were present while asking question to them.

Thus many steps were taken to give full information about the interview/ testing, to gain informed consent, to make the families feel appreciated, and to stress the importance of research on education in Bangladesh.

However ethical considerations do not began and end with fieldwork. They are part of formulating the research questions, setting the research strategy, deciding the analytic technique, interpreting the data, disseminating the findings--- and even in the way the research team works together (Alderson, 1995; Dockrell. 1985). The children, who are the focus of this evaluation, were selected in their practical setting; control groups were not created artificially. The statistical techniques used to analyse data are well established. Needless to say, the interpretation of data and dissemination of findings through this dissertation is limited by the capacity and knowledge of the author.

3.7 Selection of background variables

The background variables chosen for this study were identified by reviewing the existing literature on education in Bangladesh and developing countries. However, some of the variables, which were not supported by the literature, were chosen from the author's interests. The background variables used in this study are: age and sex of children, children's education, siblings' education, parental education, socio-

economic status, and access to communication media. A full description of these variables is given in Appendix II.

3.8 Working definition of basic education

To assess 'basic education' the modified version of the instrument that was used in the 1993 national survey was used in this study. Children satisfying the following criteria was considered to have basic education.

- a) answering 'correctly' at least seven of the ten life skills questions;
- b) answering 'correctly' at least three of the four questions from the reading comprehension passage;
- c) 'correctly' communicating a given message through letter written to father or other relative; and
- d) answering 'correctly' at least three of the four mental arithmetic questions.

The above criteria were considered as components of basic education. That means basic education may be defined by four skills: life skills, reading skills, writing skills, and numeracy skills. Children satisfying criteria (a) was considered to have life skills knowledge; satisfying criteria (b) was considered to have reading skills; satisfying criteria (c) was considered to have writing skills; and satisfying criteria (d) was considered to have numeracy skills.

The working definitions of the background variables are given in Appendix III.

3.9 Data analysis techniques

In order to explore the independent relationships between basic education and different background characteristics of children, analysis of the data was started with a bi-variate approach. Appropriate statistical tests (chi-square) were also done to establish the significance of the difference between the estimates. This type of analysis was done also for each of the four components of basic education. As the variable 'basic education' is dichotomous, logistic regression was considered suitable for the multivariate analysis (Menard, 1995; Hosmer & Lemeshow, 1989) which followed phase one of the statistics. A logistic regression model was estimated to explore the relative impact of BRAC's education programme on basic education. The regression model employed in this study was of the following form:

$$\ln [p / (1 - p)] = a + \sum b_i x_i$$

Where, p is the probability of a child having basic education,

a is the constant,

b_i values are estimated regression coefficients, and

x_i are the background characteristics of the children.

A stepwise approach was used and the model was selected by a combination of forward selection and backward elimination. Odds ratios of the regression coefficients were calculated to provide a further indication of the relative impact of BRAC's education programme. Finally, the probabilities that children with particular characteristics will have basic education were also calculated. Similar exercises (model fitting and probability estimate) were done for all the components (life skills, reading, writing and numeracy) of basic education. SPSS for Windows version 6.1

was used to analyse the data (Norusis, 1994). The measurements of the variables used in the regression analysis are given in Appendix IV.

3.10 Reliability and validity

3.10.1 Reliability of the data

Any scientific measurement is subject to error, whether it is random or non-random. Stanley says that 'the amount of chance error may be large or small, but it is universally present to some extent in any investigation' (Stanley, 1971: 356). There are several methods for exploring the reliability of measurement of data. The widely used methods for assessing reliability are-- 1) Test-retest method, 2) Alternative forms method, 3) Split-halves method, and 4) Internal consistency method.

No repeated measurement, whether with the same form or any alternative form, was done for this study. Therefore it was not possible to assess reliability following the first two methods. In split-halves method there is no common way in which the items should be divided. Several disadvantages of test-retest, alternative forms and split-halves methods have been discussed in textbooks of education and psychology (Carmines & Zeller, 1979; Guilford & Fruchter, 1978; Garrett, 1966).

The reliability of these data was established through testing its internal consistency. According to Carmines et al., (1979), Cronbach's alpha (Cronbach, 1951) formula is most commonly used to estimate reliability. Kudar & Richardson (1937) introduced a formula, which is generalised in Cornbach's alpha, and is suitable where test items are

scored dichotomously. This formula is known as Kudar-Richardson formula number 20 (or KR 20). The following is the mathematical expression of KR 20.

$$KR\ 20 = \frac{n}{n-1} \left[1 - \frac{\sum p_i q_i}{\sigma^2} \right]$$

Where, n is the number of dichotomous items

p_i is the proportion of respondent correctly answered

$q_i = 1 - p_i$

σ^2 is the variance of number of correct items

Here, $n = 19$, $\sum p_i q_i = 3.9097$ and $\sigma^2 = 31.6744$. So, $KR\ 20 = 0.9278$

This means that the reliability coefficient of the data collected for this study is .93.

Although there is no single satisfactory level of reliability, Carmines et al., (1979) say, it should not be below .80 for a widely used instrument. Thus the data of this study is satisfactorily reliable.

3.10.2 Validity of the instrument

A measuring instrument is said to be valid if it correctly measures what it intended to measure. However it is not always easy to know whether a test instrument is valid or not. Two broad categories of validity are seen in the literature of social science research, these are internal validity and external validity. There are also three types of internal validity: a) predictive validity, b) content validity and c) construct validity.

The concept of basic education used in this study was constructed from the Declaration of the World Conference on Education for All. Based on this declaration the definition of basic education was set for Bangladesh. Therefore the definition of

basic education used in this study may be validated with respect to the World Declaration. The specific instrument for measuring basic education was developed by a group of experts who work in different fields of education. They also reviewed all types of curriculum used for primary education in Bangladesh and assessed the learning needs of the children. Before finalising the instrument several pre-tests were done among different subgroups of primary school-age children (including children from formal and non-formal schools and never-schooled children). This confirmed the content validity of the instrument (Chowdhury et al., 1994 and 1992).

The results from the earlier national survey on basic education indicated a linear relationship between the performance in each of the items and years of schooling of the children. There was also a significant relationship between parental education and basic education in the children. A wide difference was observed between the performances of the children of 'good' and 'poor' schools and the performances between the 'good' and the 'poor' students in a same class (Chowdhury et al., 1994 and 1992). This confirmed the predictive validity of the test instrument.

The external validity refers to the degree to which the findings of a study can be generalised to the population from which the subjects were drawn. In this study attempts were made to establish the impact of BRAC's education programme on basic education for rural Bangladeshi children. However the children were not chosen from all the rural areas of the country. So, in a conservative sense the findings of this study can't be generalised for rural Bangladesh. However, if we consider that educational provision (whether it is formal or non-formal) in all the rural areas of Bangladesh is

similar to the areas sampled then probably it can be said that findings of this study represent all children of rural Bangladesh.

3.11 Strengths and weaknesses of the study

In educational research or any other discipline of social science it is not possible to strictly follow all the rules and procedures of research due to several constraints. Much research in social science contains some sort of weakness. Moreover, each study also has some strengths. This section discusses the strengths and weaknesses of this study.

3.11.1 Strengths

The followings are the some of strengths of the study:

1. The concept of basic education, which is the centre of this study, was taken from the World Declaration on Education for All. This allowed examination of the basic educational performance of rural Bangladeshi children from the broader perspective of global educational goals.
2. This study used an instrument which was specially developed for Bangladesh and used several times previously to assess children's performance. This made it possible to compare the current findings with other national and sub-national studies.
3. A quantitative research methodology was used in this study. This made it possible to carry out statistical tests and to explore the significance of the differences

between estimates. Use of advanced statistical techniques helped to demonstrate the relative impact of BRAC's performance on basic education of children, after controlling for other explanatory variables.

4. The study area was chosen where a socio-economic and demographic surveillance system was already underway. This helped to take the sample accurately. Reliable information about background characteristics was also possible due to familiarity of families and field researchers with one another.
5. The definition of basic education considered 'life skills knowledge' along with the 3R's. This is one step progress to traditional literacy assessment.
6. To understand the impact of BRAC's education programme this study considered one comparison and one control group rather than just one of those. This increased the merit of the study.

3.11.2 Weaknesses

The followings are some of the weaknesses of the study:

1. This study used a structured set of criteria to assess the basic education of the children. This type of formula based assessment test is vital for measuring some sort of achievement but it can't go in-depth to subtleties of educational understanding in children.
2. Basic education and its components were considered as dichotomous variables rather than continuous or even categorical variables, This reduced the strength of

the measurement. A scale outcome variable might give a finer measurement than simple 'yes' or 'no'.

3. This study looked only at the outcome performance of the children of different educational background. However the impact of any educational programme does not depend only on the outcome performance of its pupils; input and process of educational intervention need to be explored also.
4. No qualitative information was collected for this study. Fuller picture of BRAC schools would require some in-depth observations of its classroom activities, compared to those in formal schools.
5. This study failed to consider teaching and learning activities. Unfortunately, no school level variable was taken into consideration, e.g., leadership, quality of resources etc.
6. Data for this study were collected from only five areas of rural Bangladesh. Therefore the result might not be generalised to the entire country.
7. Proportions of children sampled for each of the study groups were not consistent with their proportion in the population. To overcome this problem some weighting factors might be used to calculate the estimates. Alternatively a sample might be taken by applying probability proportion to sizes of population. Neither of these was attempted.

8. Most of the BRAC school graduates are currently enrolled in formal schools. This may mean their performance is not due only to the intervention of BRAC's education programme. Some influence of the formal system might be added to the performance of BRAC school children. On the other hand, many formal school children are currently receiving education at higher grades than those of BRAC graduates. The level of basic education of children in formal schools might be higher because a disproportionate number of them were in the higher grades.

Chapter Four: Results

This chapter describes the findings of the empirical study. The background characteristics of the children are presented in the first section. The following section presents the differences in the basic educational performance of the children from the different groups. The results from the multivariate analysis are also presented in this chapter. Finally, a summary of findings is given at the end of the chapter.

4.1 Background characteristics of the children

Some background characteristics of the sampled children were collected through interviewing their parents or guardians. A table related to background information is presented in Appendix V. Among the three groups of children, the mean age of children attending the formal school was highest (12.9 years) followed by BRAC's NFPE (12.7 years) and never-schooled children (12.4 years) respectively. The most frequent occurring age of the NFPE children was 12-13 years, whereas it was 14-16 years among the formal school children and 10-11 years among the never schooled children. The children who were in education varied by current grade in school. About 18% of the non-formal and 28.8% of the formal school children were not currently enrolled in the schools at time of interview, i.e., these children had dropped out from the school system. Most of the NFPE children were currently enrolled in formal schools: 46.3% in the fourth grade, 32.5% in the fifth grade, and only 3.3% in the sixth grade. None of these children were studying higher than the sixth grade. On the other hand, most of the formal school children (42.5%) were studying at the sixth or higher grades, which ranges up to the ninth grade. Of the formal school respondents, 17.1% and 11.7% were currently at the fourth and at the fifth grades

respectively. None of the younger or the elder siblings of 54.2% of the never schooled children had a single year of schooling. Non educated siblings were also found among the children of NFPE (21.7%) and the formal school group (16.7%).

The level of parental education of the never schooled children was very low and it was relatively higher for the children of formal schools. Around 92% of the mothers of never schooled children had not a single year of education and this rate was 79.2% for the NFPE children and 53.3% for the formal school children. The fathers of all three groups of children had a better level of education than their wives. Among the fathers of the formal school children, 35.4% had not a single year of schooling, whereas 44.2% had six or more years of education. On the other hand, among the fathers of NFPE children, 55.8% had no education and 21.7% had six or more grades of education. Nearly 85% of the fathers of the non-schooled children had no education and only 5.4% had six or more years of schooling.

More than half of the children of BRAC's NFPE came from landless households, whereas the rate of landless households was 43.8% among the children of formal schools and 65.8% among the non-schooled children. It was observed that 44.2% of the households of never schooled children had poor conditions of housing, whereas this rate was 22.1% and 11.7% respectively for the children of NFPE and formal schools. More than half of the parents of the children of never schooled group reported inadequate food supply (here called 'yearly food insecurity') in their households. Yearly food insecurity was also reported in deficit by 36.7% of the parents of NFPE children and 28.8% of the parents of formal school children.

Among the non-schooled children, nearly 40% of them had no access to any type of electronic communication media, whereas this rate was 18.8% among the children of NFPE and 14.6% among the children of formal schools. Around 48% of the children of both NFPE and formal schools had access to both radio and TV, but it was only 27.1% of the children of the non-schooled group who had access to both media. More than one quarter of the children of formal schools came from non-Muslim households. This rate was 17.1% among the NFPE children and 11.3% among the non-schooling children.

Impoverished social background was found most often in children who had never been to school, less often in BRAC children and least of all in children who had attended the formal system. This is most likely explained by the fact that the poorest families need their children's labour in everyday household or economic activities whereas the families of children in the formal educational system can do without it, at least during the school times.

4.2 Bi-variate analysis

This section presents basic educational performance of the children according to their school category and sex. Statistical tests were done on the data.

4.2.1 Performance in basic education

According to the definition of basic education used in this study and all previous surveys in Bangladesh, 69.2% of the children of BRAC's NFPE satisfied all four criteria of basic education. Among the formal school children, 51.3% satisfied these

criteria and none of the never schooled children could satisfy the combined criteria of basic education (Table 4.1). When the data were broken down by sex of the children it was observed that boys of both the groups (NFPE and Formal) outperformed their peer girls. Although the difference was slightly greater among the NFPE children, no statistically significant difference was observed between the performance of boys and girls in any of the study groups. As an aggregate level, the children of BRAC's NFPE showed significantly better performance ($p < 0.001$) compared to the children of formal schools. Similar results were observed when data were analysed separately for boys and girls.

Table 4.1: Percentage of children satisfying all basic education criteria by school category and sex.

School category	Boy	Girl	Both	Remarks	
BRAC's NFPE	70.8	67.5	69.2	$\chi^2 = 0.32$;	ns
Formal	51.7	50.8	51.3	$\chi^2 = 0.02$;	ns
Never-schooled	0.0	0.0	0.0	-	na
Remarks (NFPE vs. Formal)	$\chi^2 = 9.29$; $p < 0.01$	$\chi^2 = 6.90$; $p < 0.01$	$\chi^2 = 16.08$; $p < 0.001$		

Note: ns = not significant at $p < 0.05$, na = not applicable

Table 4.2: Percentage of children satisfying partial and none of the basic education criteria by school category and sex.

School category	Partial			None		
	Boy	Girl	Both	Boy	Girl	Both
BRAC's NFPE	29.2	31.7	30.4	0.0	0.8	0.4
Formal	46.6	44.1	45.4	1.7	5.0	3.3
Never-schooled	60.8	56.6	58.7	39.2	43.3	41.3

Table 4.2 presents ‘partial basic education’ defined as children satisfying at least one of the four criteria, but not all. This table shows that 30.4% of the NFPE children and 45.4% of the formal school children possess the partial basic education skills. It was observed that 58.7% of the non-schooled children had ‘partial basic education’. Sadly, after passing three years of schooling 0.4% of the non-formal school children and 3.3% of the formal school children could pass none of the four criteria of basic education.

4.2.2 Performance in different components of basic education

The performance on each of the four assessment criteria for the children from different school categories is presented in the Tables 4.3 to 4.6. In each of the four components of basic education, more than 80% of the non-formal school children could pass the minimum level. On the other hand, among the children of formal schools, these rates were less than 70% in life and writing skills and more than 80% in reading and numeracy skills. Only 15% of the never-schooled children satisfied the criteria of life skills and 57.5% of them satisfied the criteria of numeracy skills. A negligible proportion of these children satisfied the criteria of reading and writing skills, these rates were 2.5% and 1.3% respectively. On average, the children of both formal and non-formal schools showed better performance in numeracy skills followed by reading, writing and life skills. In all the skills criteria the children of BRAC’s NFPE showed better performance than those from formal schools. However, these differences were statistically significant ($p < 0.001$) only in life skills and writing skills. The girls of all the three school categories outperformed their peer boys only in life skills. In other three components of basic education, girls lag behind

the boys. Except the performance of the formal school children in numeracy, no statistically significant gender difference was observed in the data. In numeracy, the boys of formal schools did significantly ($p < 0.05$) better than their peer girls.

Table 4.3: Percentage of children satisfying life skills criteria by school category and sex.

School category	Boy	Girl	Both	Remarks
BRAC's NFPE	85.8	87.5	86.7	$\chi^2 = 0.14$; ns
Formal	65.8	71.7	68.8	$\chi^2 = 0.95$; ns
Never-schooled	13.3	16.7	15.0	$\chi^2 = 0.52$; ns
<i>Remarks</i>				
NFPE vs. Formal	$\chi^2 = 13.09$; $p < 0.001$	$\chi^2 = 9.26$; $p < 0.01$	$\chi^2 = 22.24$; $p < 0.001$	
NFPE vs. Never	$\chi^2 = 126.16$; $p < 0.001$	$\chi^2 = 120.63$; $p < 0.001$	$\chi^2 = 246.60$; $p < 0.001$	
Formal vs. Never	$\chi^2 = 69.15$; $p < 0.001$	$\chi^2 = 73.60$; $p < 0.001$	$\chi^2 = 142.44$; $p < 0.001$	

Note: ns = not significant at $p < 0.05$

Table 4.4: Percentage of children satisfying reading skills criteria by school category and sex.

School category	Boy	Girl	Both	Remarks
BRAC's NFPE	90.8	85.8	88.3	$\chi^2 = 1.45$; ns
Formal	87.5	80.8	84.2	$\chi^2 = 2.00$; ns
Never-schooled	2.5	2.5	2.5	- na
<i>Remarks</i>				
NFPE vs. Formal	$\chi^2 = 0.69$; ns	$\chi^2 = 1.08$; ns	$\chi^2 = 1.76$; ns	

Note: ns = not significant at $p < 0.05$, na = not applicable

Table 4.5: Percentage of children satisfying writing skills criteria by school category and sex.

School category	Boy	Girl	Both	Remarks	
BRAC's NFPE	81.7	81.7	81.7	$\chi^2 = 0.07$;	na
Formal	67.5	65.8	66.7		ns
Never-schooled	0.0	2.5	1.3		na
<i>Remarks</i>					
NFPE vs. Formal	$\chi^2 = 6.35$; p<0.01	$\chi^2 = 7.77$; p<0.01	$\chi^2 = 14.09$; p<0.001		

Note: ns = not significant at $p < 0.05$, na = not applicable

Table 4.6: Percentage of children satisfying numeracy skills criteria by school category and sex.

School category	Boy	Girl	Both	Remarks	
BRAC's NFPE	98.3	95.8	97.1	$\chi^2 = 1.32$;	ns
Formal	97.5	91.7	94.6	$\chi^2 = 3.99$;	$p < 0.05$
Never-schooled	60.0	55.0	57.5	$\chi^2 = 0.61$;	ns
<i>Remarks</i>					
NFPE vs. Formal	$\chi^2 = 0.20$; ns	$\chi^2 = 1.78$; ns	$\chi^2 = 1.88$; ns		
NFPE vs. Never	$\chi^2 = 53.46$; $p < 0.001$	$\chi^2 = 53.96$; $p < 0.001$	$\chi^2 = 107.12$; $p < 0.001$		
Formal vs. Never	$\chi^2 = 50.42$; $p < 0.001$	$\chi^2 = 41.25$; $p < 0.001$	$\chi^2 = 90.58$; $p < 0.001$		

Note: ns = not significant at $p < 0.05$

Tables showing the performance of the children in basic education and its different components broken down by background characteristics are presented in Appendices VI.A to VI.E. As a considerable proportion of never-schooled children had numeracy skills, they were included when analysing numeracy.

4.3 Multivariate analysis

4.3.1 Logistic regression models

The analysis in the previous section gave some idea about the potential of the non-formal education programme of BRAC for raising the level of basic education of the rural Bangladeshi children. In the bi-variate analysis it was only possible to explore the contribution of BRAC schools considering the background characteristics separately. However, to understand the relative importance of NFPE, controlling all other variables, it was necessary to apply more advanced statistical techniques such as logistic regression. The multivariate analyses will allow us to investigate the contribution of BRAC's NFPE to children's basic education while controlling for background factors. This section describes the findings from the logistic regression analysis.

A total of five regression models (one for basic education and four for its different components) were estimated. The results of these regression models are displayed in Tables 4.7 to 4.11. Measurements of the variables used in the regression analyses are presented in Appendix IV.

Among the twelve background characteristics of the children the statistical model for basic education included only five (Table 4.7). This means that only these five background characteristics were statistically significant ($p < 0.05$) predictors of basic education of the children of rural Bangladesh. The background characteristics that contributed significantly in the model are: school category, age, current enrolment

status, mother's education and access to media. Thus the regression model for basic education suggests the following:

1. The current enrolment status of the children was found to be the most important predictor of basic education. The children who were currently in school showed 3.6 times higher performance than those who had dropped out.
2. The children of BRAC's non-formal schools were 2.62 times more likely to have basic education than their peers in formal schools. Category of school was found to be the second important predictor of basic education of the rural Bangladeshi children.
3. Age of the children significantly ($p < 0.01$) explained their performance in basic education. The children of age 12-13 years showed 1.98 times higher performance than the children of 10-11 years. This estimate was 2.38 for the children of age 14-16 years.
4. Access to electronic communication media was found to be the fourth important predictor of basic education of the children of rural Bangladesh. The children who had access to radio or TV were 2.32 times more likely to have basic education than those children who had no access to any media. Again, the children who had access to both radio and TV showed 2.45 times higher performance than the children who had no access to any media.
5. The level of mother's education was a significant predictor of basic education in her children. This variable was found to be the fifth important predictor in

the regression model. The children whose mothers had schooling experience were 1.97 times more likely to have basic education than the children of non-educated mothers.

Table 4.7: Results of logistic regression analysis predicting basic education of the children

Characteristics	Regression coefficient	S.E	Wald statistics	Level of significance	Odds ratio
School category			18.85		
Formal	0.00				1.00
BRAC's NFPE	0.96	0.22		p<0.001	2.62
Age (in year)			11.60		
10 -11	0.00				1.00
12 - 13	0.68	0.26		p<0.01	1.98
14 - 16	0.87	0.26		p<0.001	2.38
Current enrolment status			26.98		
Not enrolled	0.00				1.00
Enrolled	1.28	0.25		p<0.001	3.60
Mother's schooling			8.04		
No schooling	0.00				1.00
Some schooling	0.68	0.24		p<0.01	1.97
Access to media			10.31		
None	0.00				1.00
Radio or TV	0.84	0.30		p<0.01	2.32
Both radio and TV	0.89	0.29		p<0.01	2.45
Constant	-2.53	0.39	41.58	p<0.001	

Note: -2 Log likelihood = 558.27; Model $\chi^2 = 87.00$ with d.f = 7 (p<0.001).

The regression analysis to predict life skills knowledge of the children shows that only four variables were included in the model. These are: school category, current enrolment status, mother's education, and access to media (Table 4.8). It was observed that after adjusting for current enrolment status of the children, level of mothers education and children's access to media, the children of NFPE were 3.58

times more likely to have life skills knowledge than the children of formal schools. Although the current enrolment status of the children appeared as a significant predictor in the model its relative importance was less than the influence of the non-formal school of BRAC.

Table 4.8: Results of logistic regression analysis predicting life skills knowledge of the children

Characteristics	Regression coefficient	S.E	Wald statistics	Level of significance	Odds ratio
School category			23.72		
Formal	0.00				1.00
BRAC's NFPE	1.28	0.26		p<0.001	3.58
Current enrolment status			15.28		
Not enrolled	0.00				1.00
Enrolled	1.00	0.26		p<0.001	2.72
Mother's schooling			6.85		
No schooling	0.00				1.00
Some schooling	0.75	0.28		p<0.01	2.11
Access to media			16.09		
None	0.00				1.00
Radio or TV	0.59	0.32		ns	1.82
Both radio and TV	1.28	0.32		p<0.001	3.58
Constant	-0.99	0.32	9.21	p<0.01	

Note: -2 Log likelihood = 434.47; Model $\chi^2 = 74.88$ with d.f = 5 (p<0.001)

The variables age, current enrolment status, father's education and religion were significant predictors of reading skills of the children (Table 4.9). It should be mentioned that the variable 'school category' does not appear in the model. This means that BRAC's NFPE had no significant impact on raising reading skills in the

surveyed children. The current enrolment status of the children was the most important predictor in this model too.

Table 4.9: Results of logistic regression analysis predicting reading skills of the children

Characteristics	Regression coefficient	S.E	Wald statistics	Level of significance	Odds ratio
Age (in year)			6.50		
10 -11	0.00				1.00
12 - 13	0.47	0.34		ns	1.61
14 - 15	0.89	0.35		p<0.05	2.44
Current enrolment status			31.73		
Not enrolled	0.00				1.00
Enrolled	1.72	0.31		p<0.001	5.60
Father's education			7.61		
No schooling	0.00				1.00
1- 5 years	- 0.49	0.34		ns	0.61
6+ years	0.66	0.38		ns	1.93
Religion			5.93		
Non-Muslim	0.00				1.00
Muslim	0.81	0.33		p<0.05	2.25
Constant	- 0.40	0.42	0.89	ns	

Note: -2 Log likelihood = 332.65; Model $\chi^2 = 51.73$ with d.f = 6 (p<0.001)

Table 4.10 shows that five variables were significant predictors of writing skills in the children. These are: school category, age, current enrolment status, father's education and access to electronic media. The current enrolment status of the children was shown to be the most important predictor of their writing skills. This model also shows that after adjusting for age, current enrolment status, father's education and access to media, the children of the non-formal schools were 2.7 times more likely to have writing skills than their peers in formal schools.

Table 4.10: Results of logistic regression analysis predicting writing skill of the children

Characteristics	Regression coefficient	S.E	Wald statistics	Level of significance	Odds ratio
School category			16.60		
Formal	0.00				1.00
BRAC's NFPE	0.99	0.24		p<0.001	2.70
Age (in year)			8.84		
10 -11	0.00				1.00
12 - 13	0.40	0.28		ns	1.49
14 - 15	0.86	0.29		p<0.01	2.36
Current enrolment status			21.27		
Not enrolled	0.00				1.00
Enrolled	1.17	0.25		p<0.001	3.21
Father's education			10.64		
No schooling	0.00				1.00
1 - 5 years	0.06	0.29		ns	1.06
6+ years	0.92	0.29		p<0.01	2.52
Access to media			7.42		
None	0.00				1.00
Radio or TV	0.63	0.32		p<0.05	1.87
Both radio and TV	0.82	0.30		p<0.01	2.28
Constant	-1.55	0.39	15.85	p<0.001	

Note: -2 Log likelihood = 472.87; Model $\chi^2 = 75.81$ with d.f = 8 (p<0.001)

Only three variables were found as statistically significant predictors of the numeracy skills of the children. These variables are: age, sex and current enrolment status of the children (Table 4.11). Like many other previous models the current enrolment status of the children was shown to be the most important predictor of their numeracy skills. Gender variation in numeracy skills was observed in the data. It was observed that controlling for age and current enrolment status of the children, boys were 2.98 times more likely to have numeracy skills than their peer girls. No statistically significant impact of NFPE was found on raising numeracy skills of the children.

Table 4.11: Results of logistic regression analysis predicting numeracy skills of the children

Characteristics	Regression coefficient	S.E	Wald statistics	Level of significance	Odds ratio
Age (in year)			6.31		
10 -11	0.00				1.00
12 - 13	0.79	0.54		ns	2.20
14 - 15	1.61	0.67		p<0.05	5.00
Sex			4.10		
Girl	0.00				1.00
Boy	1.09	0.54		p<0.05	2.98
Current enrolment status			11.82		
Not enrolled	0.00				1.00
Enrolled	1.67	0.48		p<0.001	5.30
Constant	1.04	0.41	6.37	p<0.05	

Note: -2 Log likelihood = 141.03; Model $\chi^2 = 25.24$ with d.f = 4 (p<0.001)

4.3.2 Estimated probabilities

This section deals with the potential magnitude of the impact of BRAC's NFPE on basic educational performance of the children of rural Bangladesh. Using basic education and two of its components (life skills and writing skills) as dependent variables, probabilities of achieving basic education as well as life and writing skills were estimated for children who represented modal types. These probabilities were calculated from the regression models presented in the Tables 4.7, 4.8 and 4.10. This gives an opportunity to draw a picture of groups of children "typical" in the study then explore the impact of BRAC attendance on them. It should be mentioned that as attendance at non-formal schools was not related to reading and numeracy performance, no probabilities were calculated for these two skills.

Table 4.12: Estimated probabilities of children having basic education, life skills knowledge and writing skills

Characteristics	BRAC's NFPE	Formal
Basic education: Age 12-13 years, currently enrolled, mothers have no education, access to both radio and TV	0.78	0.58
Life skills: Currently enrolled, mothers have no education, access to both radio and TV	0.93	0.78
Writing skills: Age 12-13 years, currently enrol, fathers have no education, access to both radio and TV	0.86	0.70

Note: 1. These probabilities are calculated from the co-efficients of the respective regression models by using the following equation:

$$p = \exp (a + \sum b_i x_i) / [1 + \exp (a + \sum b_i x_i)]$$

2. Characteristics are selected according to the modal category of the variables

It can be seen that the probabilities of achieving basic education, life skills and writing skills were higher for the children of NFPE compared to their peers in formal schools (Table 4.12). The probability of having basic education of the NFPE children of age 12-13 years, currently enrolled in schools, whose mothers have no education and have access to both radio and TV was 0.78, whereas it was 0.58 for the children with the same characteristics who came from formal schools. Among the children who are currently enrolled in schools, whose mothers' have no education and who have access to both radio and TV --- the impact of receiving education from BRAC schools rather than formal schools increased the probability of achieving life skills knowledge by 0.15 (0.78 to 0.93). Again, among the children age 12-13 years, who are currently enrolled in schools, whose fathers' have no education and who have access to both radio and TV---the impact of receiving education from non-formal

schools rather than formal schools increased the probability of achieving writing skills by 0.16 (0.70 to 0.86).

4.4 Summary of results

The findings suggest that BRAC's education programme significantly contributed to basic educational achievement of the rural Bangladeshi children. It was shown that the BRAC children performed significantly better than the children in the formal school group on life skills and writing skills but not in writing and numeracy. All these findings are supported by both bi-variate and multivariate analyses. Interestingly, the non-schooled children did quite well on numeracy tests but still lagged significantly behind their BRAC and formal school peers in this area. It is likely that their daily experience in the household, agricultural fields and the market place passed on the numeracy skills of the community.

Multivariate analyses suggest that (with some exception) among the background characteristics, age of the children, their current school enrolment, parental education and access to media were significantly associated with achievement of basic education as well as its individual components.

The positive relationship of age with children's performance is obvious because elder children are more likely to be in the higher school grades. This argument is very relevant to formal school children as a higher correlation between age and school grade exists there. Bi-variate analysis supported this claim in that all five basic educational variables were found significantly associated with age in formal schooled children but not in BRAC children.

The better performance of the currently enrolled children than the dropped out children indicates the necessity of continuing of education after three years of schooling. The dropout children become disconnected with education and so may have lost skills in different components of basic education. This might happen especially in reading and writing, which needs regular practice. However, the importance of continuation of schooling was found even in numeracy and life skills.

The findings indicate that children's basic educational performance increases with the educational level of their parents; which is supported by other literature (Mohsin et al., 1996; Nath et al., 1996; Maynard et al., 1981; Leibowitz, 1977 & 1974). An explanation for this is that educated parents can understand the need for schooling and can attend to their children's educational requirements. Moreover, the educated parents are more likely to have higher earnings and a portion of it might be spent on children's nutrition and on domestic economy, which does not require the child's heavy labour participation.

Like Nath (1996), this study found access to media as a significant predictor of basic educational performances. In Bangladesh the communication media often broadcast programmes to encourage education. Regular literacy sessions and the programmes on life skills shown on TV and transmitted through radio may have contributed to basic education. Educational media are important in Bangladesh because there are high rates of access to TV/radio through community facilities despite low levels of private ownership.

Previous research showed that the educational performance of children varied with the socio-economic condition of the household (Mohsin et al., 1996; Nath et al., 1996; Niles, 1981). This was not shown in this study and the matter requires further investigation. It is possible that a large, cross-sectional study across the whole country would yield the expected relationship. Siblings' educational experience also failed to predict basic educational performance and this too requires further investigation.

Chapter Five: Discussion and conclusion

Like many other developing countries Bangladesh is facing difficulties in eradicating illiteracy from its society. These difficulties reflect both the limited school enrolment of the children and the inconsistent quality of their education. On independence in 1971, Bangladesh inherited a disparate and incomplete education system. Unfortunately very little progress was made in the universalisation of primary education over the next twenty years. The compulsory primary education act was implemented all over the country only in 1993. All of the eight articles of this act are concentrated to confirm enrolment of the children aged 6 to 10 years. Sadly, nothing was said about the quality of education (Government of Bangladesh, 1990). There are several categories of schools in operation to provide primary education in Bangladesh. The majority of these schools provide formal education. These schools may be government or private. There are also several non-government organisations (NGOs) who provide non-formal education. These organisations generally work in the rural areas to catch the grass-root level. The programme of the Bangladesh Rural Advancement Committee (BRAC) is the largest one, which covers more than 1.1 million children (Chowdhury et al., 1996, BRAC, 1995).

In direct response to the World Conference on Education for All (WCEFA), the government and the NGOs have taken many steps in the education sector of Bangladesh. Attempts have also been taken to measure the progress due to these efforts. All these activities are to achieve Bangladesh's goal to impart basic education for the 80% of school-aged children by 2000 AD. Different studies have shown that

the non-formal education programme of BRAC is playing an important role in the field of primary education. This programme is cost effective, its management and supervision system and community participation provides effective education to its pupils. The dropout rate of this system is very low (Ahmed et. al., 1993; Rahman Rahman Huq, 1992a and 1992b). However, no study to date has examined the educational performance of these pupils compared to children in the formal system. This study looked carefully at that issue. The aim of this study was to see the impact of BRAC's education programme on raising basic education for rural Bangladeshi children.

The results of this study showed that about half of the children from formal schools have failed to satisfy the minimum criteria of basic education. On the other hand, nearly 70% of the BRAC school children satisfied these criteria. Furthermore, the regression model to predict basic education showed that BRAC school graduates were 2.62 times more likely to have basic education than their peers from the formal system. These significant differences between the two educational systems clearly indicated the significant role of BRAC's education programme in rural Bangladesh. None of the never-schooled children satisfied the criteria for basic education. This finding was unsurprising; except for unusual cases it is not possible for the children to learn reading and writing skills without schooling. There were no gender differences confirming the findings of other studies (Nath et al., 1996 and 1993). The findings of this study showed that many children failed to achieve basic education after three years of schooling, whether in formal or in non-formal system. Some children could not pass one of the four assessment criteria. Two possible reasons might lie behind this sad situation. Firstly, the quality of education provided by these educational

systems might be too poor to achieve the minimum level of basic education. Secondly, only three years of schooling of current standard might not be adequate to achieve basic education.

There were no differences between BRAC and formal education in the achievement of reading and numeracy. This suggests that equal strength in these areas is present in both educational systems. But in the other two skills areas the BRAC children were significantly more skilled than their peers from the formal system. These are life skills and writing skills. NFPE's significant impact on life skills knowledge is understandable. One of the aims of this programme is to enhance the positive influence of education in the areas of population planning, public hygiene and health (BRAC, 1994). So life skills issues are a major part of NFPE's curriculum. The teachers of NFPE are given lessons on life skills knowledge when they take pre-service or in-service training. Again, along with school matters life skills issues are discussed in the monthly meetings of the parents. All these factors might influence the NFPE children to show better performance in the life skills part of the test. Like the national study (Nath et al., 1993) this study also found that some of the never-schooled children had life skills knowledge, this is probably the influence of the electronic communication media and/or social motivation programmes of the NGO's or their own communities. Proportionately fewer children from both the systems passed the writing skills section of the instrument. Moreover, the pupils in the BRAC schools are given lessons how to communicate through writing a letter, but this is not the case in all formal schools. It should be remembered that considering the educational level of the parents in rural Bangladesh no home task is given in BRAC schools, every lesson is taught in the classroom. These might be the cause why NFPE

children showed significantly better performance in writing skills. This suggests that the formal system needs to pay greater attention to writing exercises in the classroom. The numeracy skills section was the easiest part in the assessment instrument because it included only mental arithmetic and therefore was possible for the never-schooled children to respond correctly. However, significant gender difference in the numeracy skills of formal school children indicates unequal opportunity to learn mathematics for the formal school girls. This gender difference in arithmetic knowledge is consistent with the results of the secondary analysis of a national sample survey (Nath, 1997)^{etal.}

The results of the multivariate analyses suggest that school category (formal/non-formal) was not the principal factor for the variation in basic educational achievement of the interviewed children. It was the current school enrolment of the children that appeared to be the main predictor of basic education. It was observed that among the five regression models, the current enrolment status of the children was the most important predictor in four models (basic education, reading skills, writing skills and numeracy skills). These findings suggest the inadequacy of the current standard of only three years of schooling to achieve basic education for all the children. It will require co-operation between the formal and non-formal education sectors to address this situation. That means the co-operation between government and non-government organisations in education sector. It was seen in the data that among the dropped out children (i.e., who completed only three years of schooling), BRAC school graduates did significantly better than the formal school learners in all the four skills area and as well as in basic education. This indicates that if the children of rural Bangladesh get

only three years of schooling from any of the formal or non-formal system, the NFPE learners do better than their formal school peers.

We turn to the question as to which type of education can help Bangladesh to achieve the WCEFA goal i.e., to impart basic education for 80% of the school-aged children. Bivariate analyses showed that of the children who had completed at least five years of schooling, more than 80% of them crossed the minimum criteria of basic education and all the skills criteria separately. This indicates the need for completion of five years of primary education for all children. Is it possible for the BRAC's education programme to achieve 80% level of basic education to its learners? The answer of this question is probably yes. Previous study on NFPE graduates showed that nearly three quarters of them had basic education when tested after ten months of their graduation. The enrolment in formal schools of these graduates was found to be the most significant predictor of their basic educational achievement, when other explanatory variables were held constant (Nath et al., 1996). These examples suggest two things: firstly, that there is a scope to improve the quality of BRAC's non-formal education; and secondly, that it is necessary to continue education for the BRAC school graduates in formal schools at least up to grade five. An experiment can be considered to test the effectiveness of BRAC schools if they run a five-year cycle. But what about the formal schools? It was seen in the data that less than 40% of the learners of formal schools could achieve basic education even they were currently in fifth grade. This performance is frustrating, as the level of basic education of these formal school learners was slightly better than the half of the level of NFPE. The formal system could only exceed the WCEFA goal when the students had at least seven years of schooling. This suggests very poor quality of educational provision in

these schools. Different studies have shown that the management and supervision, community participation, pupils' attendance, teachers quality and classroom culture are very weak in the formal education system in rural Bangladesh (Alam et al., 1996, Chowdhury et al., 1996). A major improvement is necessary in these regards if the formal schools want to become as effective as non-formal ones. Joint collaboration by government and BRAC in management and supervision of the schools and teachers training can be considered seriously.

In this study it was not possible to follow a true randomised experimental design because it is unethical to enrol the children in formal or non-formal schools through randomisation, ignoring their parents' will. However a quasi-experiment design with statistically equated controls was used in this study. The children were selected randomly from different educational groups, controlling age and sex at aggregate level. As mentioned earlier this study should be complemented by in-depth classroom observations to understand the classroom culture of both formal and non-formal systems. This in-depth observation might be helpful in understanding processes involved in maintaining quality in education. The children of formal and non-formal system were not mutually exclusive in the sense of intervention received because some attendance in the formal system may be found in the non-formal children. To avoid this, children of two systems might be assessed when they were in their respective schools i.e., just before completing grade three. The present situation has a positive side too. It pointed to the future direction related to continuation of education of the rural Bangladeshi children. As none of the never-schooled children could pass basic education criteria they may be excluded from future comparative studies like this.

Finally, the following tentative conclusions might be drawn from this study, bearing in mind the limitations outlined in chapter three.

1. The impact of non-formal education programme (NFPE) of BRAC was significant in the achievement of basic education in the children of rural Bangladesh.
2. The impact of NFPE was apparent in the life skills knowledge and the writing sections of the instrument, but not in reading or numeracy skills. In reading and numeracy both systems showed the same performance.
3. The current school enrolment of children was a stronger predictor of basic education than attendance at NFPE.
4. ✓ None of the formal or non-formal systems was observed to achieve the level of basic education targeted by WCEFA, although NFPE children got nearer to the expected level.
5. ✓ A three-year schooling (in any system) at the present standard appears to be inadequate to achieve WCEFA goal. At least five years of schooling may be necessary for this.
6. There was no gender variation in basic educational achievement, but the girls of the formal schools were significantly less competent in numeracy than their peers boys.

5.1 Recommendations

The following are the recommendations based on the findings of this study. The recommendations need not necessarily be in order of priority and more importantly, some extend beyond the findings. However, all are supported by the results reported earlier.

1. More NFPE centres should be opened in rural areas of Bangladesh.
2. Teachers of the BRAC schools should pay greater attention to the needs of their learners. It may be that some children may not go with all others due to special difficulties. Slightly improved care may reach NFPE towards WCEFA goal on basic education.
3. An initiative might be taken to test the effectiveness of BRAC schools if they run for five years. If this experiment gives expected results, BRAC might consider setting a five-year cycle of non-formal education.
4. To improve the quality of primary education in rural Bangladesh a joint collaboration between the government and BRAC should be considered seriously. BRAC might take responsibility for management and supervision of schools, teachers training and community mobilisation.

5. The government should take steps for full implementation of the compulsory primary education act 1990. Quality of education issues should be incorporated in an amended or new act.
6. Quality of education in formal schools should be monitored in a regular basis.
7. More emphasis on life skills knowledge and writing should be given in the classrooms of formal system.
8. Quality mathematics learning for the girls should be emphasised in the formal schools.
9. Some activities which are components of BRAC might be implemented in the formal system. These include short-term in-service training for the teachers, monthly parents meeting, and regular supervision and monitoring. Books should be examined whether those can meet the needs of everyday rural lives in Bangladesh.

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Appendix I
Questionnaire (English version)

**The Impact of BRAC's Education Programme on Raising Basic
Education Levels for the Children of Rural Bangladesh**

Strictly confidential: information
to be used for research only

A. Identification

District:_____ Union:_____ Village:_____
Household number:_____ Line number:_____ PIN:_____
Name of the children:_____ Sex: Boy = 1, Girl = 2
Stratum: BRAC's NFPE = 1, Formal school = 2, Never-schooled = 3

THIS PART TO BE COLLECTED FROM PARENTS

B. Background Information

1. Age of the children (in years):_____
2. Current enrolment status:
Currently enrolled = 1, Dropped out = 2. Never enrolled = 3
3. Year of schooling:_____
4. Mother's education (in year):_____
5. Father's education (in year):_____
6. Father's occupation: Agriculture = 1, Business = 2, Service = 3, Professional = 4
7. Education of siblings (in year): Younger:_____ Elder:_____
8. Religion: Muslim = 1, Non-Muslim = 2
9. Land ownership (in decimal):_____
10. Housing condition: Poor = 1, Good = 2
11. Yearly food security status of the household: Deficit = 1, Balance or above = 2

FOLLOWING PARTS TO BE COLLECTED FROM CHILDREN

12. Access to media of the respondent child (ask the child whether he/she listened to the radio programme or/and watched a programme on television within last 7 days)
Radio: Yes = 1, No = 2 Television: Yes = 1, No = 2

C. Assessment of Life skills

1. What is a good and easy treatment for diarrhoea?
Correct (Packed saline/ oral rehydration saline (ORS)/ salt-molasses-water saline/ home made saline) = 1, Incorrect = 2, Does not know = 9
2. Where should one defecate?
Correct (Sanitary/slab/pit latrine) = 1, Incorrect = 2, Does not know = 9
3. What benefit comes from vaccination for child?
Correct (Diseases prevented) = 1, Incorrect = 2, Does not know = 9
4. What food helps prevent night blindness?
Correct (Green vegetables/ certain fruits/ small fish/ vitamin A capsule) = 1, Incorrect = 2, Does not know = 9
5. How can water be made drinkable?
Correct (Boiling/ using alum/ using water purification tablet) = 1, Incorrect = 2, Does not know = 9
6. If someone gets a very high temperature, what should one do at first?
Correct (Cool body/head with water) = 1, Incorrect = 2, Does not know = 9
7. Do you know, what prevents poultry and livestock falling ill?
Correct (Vaccination) = 1, Incorrect = 2, Does not know = 9
8. How many brothers and sisters should there be in a family?
Correct (Number 1/2) = 1, Incorrect = 2, Does not know = 9
9. Among your brothers and sisters, whose schooling is most essential?
Sisters = 1, Brothers = 2, Both (correct) = 3. None = 4, Does not know = 9
10. What is the name of the Prime Minister of Bangladesh?
Correct (Sheikh Hasina) = 1, Incorrect = 2, Does not know = 9

D. Assessment of Reading Skills

1. Interviewer: show the following “word” card and ask the child to read each word loud

Mother:	Can read = 1,	Can't read = 2
Pond:	Can read = 1,	Can't read = 2
Co-operation:	Can read = 1,	Can't read = 2
Freedom:	Can read = 1,	Can't read = 2
Savings:	Can read = 1,	Can't read = 2

2. Interviewer: show the following "sentence" card and ask the child to read it loud
Five trees fell down in the storm
 Can read = 1, Can read partially = 2, Can't read = 3
3. Interviewer: show the following "passage" card and ask the child to read attentively. Tell him/her that you will ask him/her some questions afterwards.

Gofur Miah is a good farmer. He grows paddy, jute, potatoes etc. He uses this to feed his family. He sells some and saves in the bank. His son and daughter study in school. Gofur Miah with his wife and two children is a small family. Small family is happy family.

Oral questions

- a) What does Gofur Miah cultivate in his land?
 Correct = 1, Incorrect = 2, Can't say = 3
- b) Where does he save money?
 Correct = 1, Incorrect = 2, Can't say = 3
- c) How many members are there in his family?
 Correct = 1, Incorrect = 2, Can't say = 3
- d) Why small family is happy family?
 Correct = 1, Incorrect = 2, Can't say = 3

E. Assessment of Writing Skills

1. Interviewer: Ask the child to write his/her name and the name of his/her village/town.
 Name: Can write = 1, Can't write = 2
 Village/town: Can write = 1, Can't write = 2
2. Interviewer: Dictate the following words one by one and ask him/her to write them.
 Water: Correct = 1, Partially correct = 2, Can't write = 3
 Bangladesh: Correct = 1, Partially correct = 2, Can't write = 3
 Education: Correct = 1, Partially correct = 2, Can't write = 3
3. Interviewer: Dictate the following sentence and ask the child to write.
Our country is very beautiful
 Correct = 1, Partially correct = 2, Can't write = 3
4. Interviewer: Ask the child to write a letter to his/her father or to any relative that he/she passed the exam (3/4 sentence)
 Salutation: Can write = 1, Can't write = 2
 Communication of message: Can write = 1, Can't write = 2
 Sincerely: Can write = 1, Can't write = 2

F. Assessment of Numeracy Skills

1. Interviewer: Ask the child to count 40-50.
Can count = 1, Can count partially = 2, Can't count = 3
2. Interviewer: Show the following "numbers" card and ask the child to read the numbers loud.
3: Can read = 1, Can't read = 2
49: Can read = 1, Can't read = 2
500: Can read = 1, Can't read = 2
3. Interviewer: Dictate the following numbers and ask the child to write.
5: Can read = 1, Can't read = 2
67: Can read = 1, Can't read = 2
208: Can read = 1, Can't read = 2
4. Interviewer: Ask the child to do the following addition.
$$\begin{array}{r} 5 \\ + 53 \\ + 20 \\ \hline \end{array}$$
Correct = 1, Can't do = 2
5. Interviewer: Ask the child to do the following subtraction.
$$\begin{array}{r} 70 \\ - 43 \\ \hline \end{array}$$
Correct = 1, Can't do = 2
6. Interviewer: This part is mental arithmetic. Read the followings one by one and ask the child to answer orally.
 - a) In the market you have bought fish for Tk. 15, potatoes for Tk. 5, and green chelis for Tk. 2. How much money have you spent?
Correct = 1, Incorrect = 2, Can't say = 3
 - b) You had Tk. 30. You bought a notebook and pencils for Tk. 15. How much money do you have left?
Correct = 1, Incorrect = 2, Can't say = 3
 - c) You bought 4 pens costing Tk. 3 each. How much did you spend on 4 pens?
Correct = 1, Incorrect = 2, Can't say = 3
 - d) Divide Tk. 40 among 4 persons equally. How much each will get?
Correct = 1, Incorrect = 2, Can't say = 3

Name of the interviewer: _____ Date: _____

Exercise Book

Identification

District: _____ Union: _____ Village: _____
Household number: _____ Line number: _____ PIN: _____
Name of the children: _____ Sex: Boy = 1, Girl = 2
Stratum: BRAC's NFPE = 1, Formal school = 2, Never-schooled = 3

Writing Assessment Part

Question No. 1

- a) Name: _____
- b) Village/Town: _____

Question NO. 2

- a) _____
- b) _____
- c) _____

Question NO. 3

Question NO. 4

Numeracy Assessment Part

Question NO. 3

Question NO. 4

Add

$$\begin{array}{r} 5 \\ + 53 \\ + 20 \\ \hline \end{array}$$

Question NO. 5

Subtract

$$\begin{array}{r} 70 \\ - 43 \\ \hline \end{array}$$

Name of the interviewer: _____

Date: _____

Appendix II:

Justification of selecting background variables

Sex of children: In Bangladesh and the developing world women lag behind men in many aspects, an unhealthy atmosphere for development. Many grass-root activities (such as micro credit programmes for the women, schooling for girls etc.) are in operation in Bangladesh to improve the position of females in the society. Thus there is a general concern by educational/ development activists to see whether differences between male and female can be lessened by intervention. Research on enrolment and census data on enrolment and literacy show that girls are disadvantaged compared to boys (Nath, 1997; Hadi, 1995; Bangladesh Bureau of Statistics, 1994). However, no significant gender differences were found in the basic educational studies in Bangladesh (Mohsin et al., 1996; Nath et al., 1996, 1994 & 1993). To clarify this issue 'sex of children' was considered as a variable for this study.

Age of children: There is a possibility that older children are more likely to achieve basic education than their younger peers because basic education demands life skills knowledge. Moreover, age may be highly correlated with school grades (especially in children from formal education) and obviously pupils of higher grades are more likely to have a higher level of education. Previous research on BRAC graduates showed that age is a significant predictor of their educational achievement (Nath, 1996).

Children's education: It is more likely that children in the higher grades of school might have better educational level. National studies on basic education showed that years of schooling of the children was a significant predictor of their performance (Chowdhury et al., 1992; Mohsin et al., 1996). The study on BRAC school graduates also showed that current enrolment of the respondents was the most important predictor of their basic educational achievement (Nath et al., 1996). Thus this study considered several aspects of children's education as background variables.

Siblings' education: No previous study on basic education has considered siblings' educational experience and level as an explanatory variable. It can be expected that if more than one child of a household attends school, the educational environment of that household is more advantageous than others. This may create some type of co-operation and/or competition among siblings. Such an environment of the household might lead to better performance in basic education.

Parental education: The effects of parental education on children's educational achievement are well documented in much literature (Leibowitz, 1977, 1974; Murnane, Maynard & Ohls, 1981) and it is believed that more educated parents promote their children's learning. Basic educational studies conducted in Bangladesh showed that parental education significantly predicted the achievement of the children, this pattern was common in both national and BRAC data (Mohsin et al., 1996; Nath et al 1996). Although both father's and mother's educational level has an effect on children's achievement, mother's education was found more powerful than father's education (Leibowitz, 1977; Murnane et al., 1981; Mohsin et al., 1996, Nath et al., 1996). As the results of the recent studies on Bangladesh and as well as the studies of 1970's showing the impact of parental education on their children's academic achievement, it was thought that this variable is relevant for this study too.

Socio-economic status: Literature on developing countries suggests that the relationship between socio-economic status and academic achievement is substantial in many developing

countries and even sometimes greater than that generally reported in the industrialised countries (Niles, 1981). Socio-economically better off households do not need to send their children to work, whereas this is unavoidable for the poorer households and may lead to lower performance for their children. However, this should happen only for the formal school children because BRAC schools set school times in such a way to enable all children to participate in the class. Nath et al., (1996) found that BRAC graduates who came from those households having relatively more land and stable yearly food security status were more likely to have basic education than others. National data also confirm that yearly economic status of the household is positively related to level of basic education (Mohsin et al., 1996).

Religion: No previous studies on basic education have explored variation in achievement due to religious belief. In general, census data show that non-Muslims' are more likely to attend schools and as well as to be more literate than their Muslim peers (Bangladesh Bureau of Statistics, 1995). Historical political/economic reason might play a role behind this situation (Rahim, 1992). A recent study by Hadi (1995) showed that non-Muslims' are significantly less likely to get access to schools than their Muslim peers in rural Bangladesh. It was thought that religious belief might be a predictor of basic education, so this study included it as a background variable.

Access to electronic communication media: Access to electronic communication media may help in raising knowledge. In Bangladesh, radio and television transmit attractive advertisements to encourage schooling and how to take care of health. Programmes on different life skills issues (such as health, disaster, agriculture etc.) and literacy sessions are also regularly featured by these media. Nath et al., (1996) showed that children who had access to electronic communication media were more likely to have basic education than those who had no access; however, impact of television was found more pronounced than radio.

Appendix III

Working definitions of background variables

School category: Three groups of children were included in this study. These are:

BRAC school graduate: Children who completed the three-year curriculum of BRAC's non-formal education programme.

Formal school learner: Children who completed at least three years of the curriculum in any formal school (government or non-government).

Never-schooled children: Children who have never attended any kind of formal or non-formal school.

Age and sex of the children: Sex of the children was defined in a natural way and age was considered in years.

Children's education: The majority of the children of BRAC's NFPE and formal schools were currently enrolled in school. Current grade in school was taken to represent the level of education of the children.

Education of siblings: This variable was categorised as 'yes' and 'no'. If any one of the younger or elder brother/sister had at least one year of schooling then it was considered as 'yes' and otherwise 'no'.

Parental education: Fathers' and mothers' level of education was measured by the years of schooling they completed in any type of school. As the majority of the mothers in rural Bangladesh have no schooling, mother's education was categorised as 'schooling' and 'non-schooling'. On the other hand, father's education was categorised as 'no schooling', '1-5 years of schooling' and '6+ years of schooling'.

Socio-economic status: There is no official provision to define social class in Bangladesh. The majority of its rural population work in the informal sector. Three types of variables were considered to summarise the socio-economic status of the households. These were: housing condition; land ownership; and yearly food security status. Housing condition was categorised as 'poor' and 'good' according to materials used to build it. Land ownership status was categorised as 'landless' and 'landholder'. Yearly food security status was categorised as 'deficit' and 'balance or above'. Parents were asked to assess their household in respect to yearly income and expenditure of the household. Households having good conditions of house, owning land and categorised themselves as in balance or above balance in yearly food security status were considered as economically better off households.

Religion: Muslims are the majority in the population in Bangladesh. The variable was categorised into two: Muslim and non-Muslim.

Access to communication media: Only radio and television were considered as communication media. In rural Bangladesh, having television is very rare but some households have radio. People generally watch television at a nearby club or any rich person's house. On the other hand, having radio/television in the household does not mean anything if nobody uses them. Thus in this study the children were asked whether they listened to the radio programme or/and watched a programme on television within 7 days of the interview. If they answered 'yes' they were classified as having access to electronic communication media.

Appendix IV: Measurement of variables used in multivariate analysis

Appendix IV: Measurement of the dependent and the explanatory variables used in the regression analyses.

Variables	Measurement
Dependent Variables	
Basic education	1= Has, 0= Has not
Life skills	1= Has, 0= Has not
Reading skills	1= Has, 0= Has not
Writing skills	1= Has, 0= Has not
Numeracy Skills	1= Has, 0= Has not
Explanatory variables	
School category	1= Formal school, 2= BRAC's NFPE
Age of children (in year)	1= 10-11, 2= 12-13, 3= 14-16
Sex of children	1= Girl, 2= Boy
Children's school enrolment	1= Not currently enrolled, 2= Enrolled
Siblings education	1= No education, 2= Some education
Mother's education	1= No schooling, 2= Some schooling
Father's education	1= No schooling, 2= 1-5 years of schooling, 3= 6+ years of schooling
Land ownership	1= Landless, 2= Landholder
Housing condition	1= Poor, 2= Good
Yearly food security status	1= Deficit, 2= Balance or above
Religion	1= Non-Muslim, 2= Muslim
Access to electronic media	1= No access, 2= Radio or TV, 3= Both radio and TV

Appendix V: **Table on children's background characteristics**

Appendix V: Number and percentage of the children broken down by their background characteristics

Background characteristics	BRAC's NFPE		Formal school		Never- schooled	
	%	n	%	n	%	n
Age (in years)						
10 - 11	25.8	62	27.5	66	44.2	106
12 - 13	43.3	104	30.4	75	20.0	48
14 - 16	30.8	74	42.1	101	35.8	86
Mean	12.7		12.9		12.4	
Current grade						
Nil	17.9	43	28.8	69	na	
Fourth	46.3	111	17.1	41	na	
Fifth	32.5	78	11.7	28	na	
Sixth and more	3.3	8	42.5	102	na	
Siblings' education						
No education	21.7	52	16.7	40	54.2	130
Some education	78.3	188	83.3	200	45.8	110
Mother's education						
No-schooling	79.2	190	53.3	128	92.1	221
Some schooling	20.8	50	46.7	112	7.9	19
Father's education						
None	55.8	134	35.4	85	84.6	203
1 - 5 years	22.5	54	20.4	49	10.0	24
6+ years	21.7	52	44.2	106	5.4	13
Land ownership status						
Landless	52.5	126	43.8	105	65.8	158
Land owner	47.5	114	56.2	135	34.2	82
Housing condition						
Poor	22.1	53	11.7	28	44.2	106
Good	77.9	187	88.3	212	55.8	134
Yearly food security status						
Deficit	36.7	88	28.8	69	50.8	122
Balance or above	63.3	152	71.2	171	49.2	118
Religion						
Muslim	82.9	199	71.7	172	88.7	213
Non-Muslim	17.1	41	28.3	68	11.3	27
Access to media						
No access	18.8	45	14.6	35	39.6	95
Radio or TV	32.9	79	37.5	90	33.3	80
Both radio and TV	48.3	116	47.9	115	27.1	65

Appendix VI.A:

Basic education and background characteristics

This appendix presents the differences in the level of basic education between formal and non-formal schools, considering the children's background characteristics separately. The reader is reminded that variables shown to have a significant effect on educational outcome in bi-variate analysis may or may not remain significant when they are attempted into multivariate models. The multivariate strategy is more powerful because it allows all the predictor variables to be tested at the same time for their effect in the educational outcome. In reality all the predictors are operating at the same time; in one sense, in multivariate analysis this has a simultaneous impact of many factors on children's achievement.

Children's age and basic education

It was not surprising that the level of basic education varied with age of the children (Table A.1). However, this variation was statistically significant ($p < 0.001$) only among the children of formal schools whose level of basic education increased with age. Otherwise, the elder (14-16 years) children of NFPE lag behind their younger peers. A statistically significant difference between formal and non-formal schools was found among the younger children ($p < 0.001$ for 10-11 years and $p < 0.05$ for 12-13 years), where NFPE children performed better than formal school children. It was also observed that the difference between these two groups became smaller as the age of the respondents increased.

Table A.1: Percentage of children satisfying all basic education criteria by age and school category.

Age group (in year)	BRAC's NFPE	Formal	Remarks
10 - 11	71.0	25.8	$\chi^2 = 26.19$; $p < 0.001$
12 - 13	72.1	56.2	$\chi^2 = 4.83$; $p < 0.05$
14 - 16	63.5	64.4	$\chi^2 = 0.01$; ns
Remarks	$\chi^2 = 1.63$; ns	$\chi^2 = 24.82$; $p < 0.001$	

Note: ns = not significant at $p < 0.05$

Current school enrolment and basic education

The performance in basic education varied significantly ($p < 0.001$) according to the current enrolment status of the children (Table A.2). The currently enrolled children were more likely to have basic education compared to the children who were not in the school roll at the time of survey. But the difference in the level of basic education was much higher for formal school children than the NFPE children. Among the children of both groups (currently enrolled and not enrolled), the children of formal schools were significantly less likely to have basic education than the children of NFPE.

Table A.3 presents the level of basic education according to current grade of the children. Among the children of fourth and fifth grades, the children who came from non-formal schools were significantly ($p < 0.001$) more likely to have basic education than the children of formal schools. No significant variation was observed among the children of the grades sixth and more, one reason might be very small sample size for NFPE in this subgroup.

Table A.2: Percentage of children satisfying all basic education criteria by current enrolment status and school category.

Current enrolment status	BRAC's.NFPE	Formal	Remarks
Dropped out	48.8	23.2	$\chi^2 = 7.88$; $p < 0.01$
Currently enrolled	73.6	62.6	$\chi^2 = 5.16$; $p < 0.05$
Remarks	$\chi^2 = 10.15$; $p < 0.001$	$\chi^2 = 30.52$; $p < 0.001$	

Table A.3: Percentage of children satisfying all basic education criteria by current grade in school and school category.

Current grade	BRAC's NFPE	Formal	Remarks
Nil*	48.8	23.2	$\chi^2 = 7.88$; $p < 0.01$
Fourth	71.2	31.7	$\chi^2 = 19.51$; $p < 0.001$
Fifth	75.6	39.3	$\chi^2 = 12.14$; $p < 0.001$
Sixth or more	87.5	81.4	$\chi^2 = 0.18$; ns
Remarks	$\chi^2 = 11.34$; $p < 0.01$	$\chi^2 = 66.66$; $p < 0.001$	

Note: * marked children dropped out after three years of schooling; ns = not significant at $p < 0.05$

Siblings' education and basic education

Table A.4 shows the relationship between basic education in the focal children and their siblings' education. It was observed that the children whose siblings had some years of schooling showed slightly better performance in basic education compared to those who had no educated siblings. No statistically significant impact of siblings' education was observed in the data. The impact of NFPE was found statistically significant ($p < 0.001$) among those children whose siblings had some years of schooling.

Table A.4: Percentage of children satisfying all basic education criteria by sibling education and school category.

Siblings' education	BRAC's NFPE	Formal	Remarks
No education	59.6	40.0	$\chi^2 = 3.48$; ns
Some education	71.8	53.5	$\chi^2 = 13.84$; $p < 0.001$
Remarks	$\chi^2 = 2.84$; ns	$\chi^2 = 2.43$; ns	

Note: ns = not significant at $p < 0.05$

Parental education and basic education

Tables A.5 and A.6 present the proportions of children satisfying basic education criteria according to the level of education of their mothers and fathers respectively. Children whose mothers had some schooling were more likely to have basic education than those of never schooled mothers. However, this was statistically significant only among the children of formal schools ($p < 0.001$). The influence of NFPE was much prominent among the children of never schooled mothers (Table A.5).

Table A.5: Percentage of children satisfying all basic education criteria by mothers' education and school category.

Mothers' schooling	BRAC's NFPE	Formal	Remarks
No schooling	67.4	39.1	$\chi^2 = 24.86$; $p < 0.001$
Some schooling	76.0	65.2	$\chi^2 = 1.88$; ns
Remarks	$\chi^2 = 1.38$; ns	$\chi^2 = 16.31$; $p < 0.001$	

Note: ns = not significant at $p < 0.05$

Table A.6: Percentage of children satisfying all basic education criteria by fathers' education and school category.

Fathers' education	BRAC's NFPE	Formal	Remarks
Nil	64.2	40.0	$\chi^2 = 12.28$; $p < 0.001$
1 - 5 years	66.7	44.9	$\chi^2 = 4.95$; $p < 0.05$
6+ years	84.6	63.2	$\chi^2 = 7.65$; $p < 0.01$
Remarks	$\chi^2 = 7.54$; $p < 0.05$	$\chi^2 = 11.16$; $p < 0.01$	

Fathers' education was positively associated with their children's level of basic education (Table A.6). The differences in the levels of basic education of the children according to the levels of education of their fathers were much prominent among the formal school children ($p < 0.01$) than the NFPE children ($p < 0.05$). In all the three levels of fathers education, non-formal school children showed significantly better performance than the children of formal schools. The influence of NFPE was relatively greater among the children of never schooled fathers.

Socio-economic status and basic education

As mentioned earlier, three variables were used to summarise the socio-economic status of the households of the children, these are: land ownership; housing condition; and yearly food security of the households. The levels of basic education of the children according to their socio-economic status are presented in Tables A.7 to A.9. Not surprisingly, the children of better off households were more likely to have basic education than the children of poorer households. However, statistically significant difference ($p < 0.05$) was observed only among the NFPE children when the data were broken down by housing condition. It was also

observed that except the children with poor housing, the children of non-formal schools showed significantly better performance compared to the children of formal schools in all other cases.

Table A.7: Percentage of children satisfying all basic education criteria by land ownership status of the household and school category.

Land ownership status	BRAC's NFPE	Formal	Remarks
Landless	68.3	48.6	$\chi^2 = 9.19$; $p < 0.01$
Landholder	70.2	53.3	$\chi^2 = 7.37$; $p < 0.01$
Remarks	$\chi^2 = 0.10$; ns	$\chi^2 = 0.54$; ns	

Note: ns = not significant at $p < 0.05$

Table A.8: Percentage of children satisfying all basic education criteria by housing condition and school category.

Housing condition	BRAC's NFPE	Formal	Remarks
Poor	56.6	42.9	$\chi^2 = 1.39$; ns
Good	72.7	52.4	$\chi^2 = 17.48$; $p < 0.001$
Remarks	$\chi^2 = 5.03$; $p < 0.05$	$\chi^2 = 0.89$; ns	

Note: ns = not significant at $p < 0.05$

Table A.9: Percentage of children satisfying all basic education criteria by yearly food security status of household and school category.

Yearly food security status	BRAC's NFPE	Formal	Remarks
Deficit	68.2	43.5	$\chi^2 = 9.65$; $p < 0.01$
Balance or above	69.7	54.4	$\chi^2 = 8.02$; $p < 0.01$
Remarks	$\chi^2 = 0.06$; ns	$\chi^2 = 2.34$; ns	

Note: ns = not significant at $p < 0.05$

Religion and basic education

The levels of basic education of the children according to their religious beliefs are presented in Table A.10. The Muslim children of NFPE were more likely to have basic education than their non-Muslim peers ($p < 0.01$). On the other hand, the non-Muslim children of formal schools showed slightly better performance than their Muslim peers. The impact of BRAC

schools was much more prominent among the Muslim children ($p<0.001$) than the non-Muslim children.

Table A.10: Percentage of children satisfying all basic education criteria by religion and school category

Religion	BRAC's NFPE	Formal	Remarks	
Muslim	72.9	50.0	$\chi^2 = 20.53$;	$p<0.001$
Nom-Muslim	51.2	54.4	$\chi^2 = 0.10$;	ns
Remarks	$\chi^2 = 7.47$; $p<0.01$	$\chi^2 = 0.38$; ns		

Note: ns = not significant at $p<0.05$

Communication media and basic education

Access to electronic communication media had a significant positive effect on basic education of the children of both formal and non-formal schools (Table A.11). Among the children of NFPE who had no access to any type of electronic media, 53.3% had achieved basic education. This is a striking achievement because it is approximately the same percentage of children in the formal schools who achieved basic education with the advantage of media access. The children of NFPE showed significantly ($p<0.01$) better performance than the children from formal schools in all the three categories of access to electronic media.

Table A.11: Percentage of children satisfying all basic education criteria by access to electronic communication media and school category.

Access to electronic communication media	BRAC's NFPE	Formal	Remarks	
No access	53.3	25.7	$\chi^2 = 6.20$;	$p<0.01$
Radio or TV	70.9	52.2	$\chi^2 = 6.16$;	$p<0.01$
Both radio and TV	74.1	58.3	$\chi^2 = 6.51$;	$p<0.01$
Remarks	$\chi^2 = 6.74$; $p<0.05$	$\chi^2 = 11.43$; $p<0.01$		

Appendix VI.B

Life skills knowledge and background characteristics

Table B.1: Percentage of children satisfying life skills criteria by age and school category.

Age group (in year)	BRAC's NFPE	Formal	Remarks
10 - 11	90.3	51.5	$\chi^2 = 23.06$; $p < 0.001$ $\chi^2 = 8.40$; $p < 0.01$ $\chi^2 = 0.16$; ns
12 - 13	89.4	72.6	
14 - 16	79.7	77.2	
Remarks	$\chi^2 = 4.48$; ns	$\chi^2 = 13.01$; $p < 0.01$	

Note: ns = not significant at $p < 0.05$

Table B.2: Percentage of children satisfying life skills criteria by current enrolment status and school category.

Current enrolment status	BRAC's NFPE	Formal	Remarks
Dropped out	74.4	47.8	$\chi^2 = 7.69$; $p < 0.01$ $\chi^2 = 9.90$; $p < 0.01$
Currently enrolled	89.3	77.2	
Remarks	$\chi^2 = 6.80$; $p < 0.01$	$\chi^2 = 19.73$; $p < 0.01$	

Table B.3: Percentage of children satisfying life skills criteria by current grade in school and school category.

Current grade	BRAC's NFPE	Formal	Remarks
Nil*	74.4	47.8	$\chi^2 = 7.69$ $p < 0.01$ $\chi^2 = 16.73$ $p < 0.001$ $\chi^2 = 11.80$; $p < 0.001$ $\chi^2 = 0.96$; ns
Fourth	88.3	58.5	
Fifth	89.7	60.7	
Sixth or more	100.0	89.2	
Remarks	$\chi^2 = 7.70$; ns	$\chi^2 = 36.78$; $p < 0.001$	

Note: * marked children dropped out after three years of schooling; ns = not significant at $p < 0.05$

Table B.4: Percentage of children satisfying life skills criteria by siblings education and school category.

Siblings' education	BRAC's NFPE	Formal	Remarks
No education	78.8	60.0	$\chi^2 = 3.87$; $p < 0.05$
Some education	88.8	70.5	$\chi^2 = 19.89$; $p < 0.001$
Remarks	$\chi^2 = 3.51$; ns	$\chi^2 = 1.71$; ns	

Note: ns = not significant at $p < 0.05$

Table B.5: Percentage of children satisfying life skills criteria by mother's education and school category.

Mother's schooling	BRAC's NFPE	Formal	Remarks
No schooling	83.7	60.2	$\chi^2 = 22.12$; $p < 0.001$
Some schooling	98.0	78.6	$\chi^2 = 10.00$; $p < 0.01$
Remarks	$\chi^2 = 7.02$; $p < 0.01$	$\chi^2 = 9.43$; $p < 0.01$	

Table B.6: Percentage of children satisfying life skills criteria by father's education and school category.

Father's education	BRAC's NFPE	Formal	Remarks
Nil	81.3	63.5	$\chi^2 = 8.67$; $p < 0.01$
1 - 5 years	88.9	65.3	$\chi^2 = 8.24$; $p < 0.01$
6+ years	98.1	74.5	$\chi^2 = 13.27$; $p < 0.001$
Remarks	$\chi^2 = 9.38$; $p < 0.01$	$\chi^2 = 2.99$; ns	

Note: ns = not significant at $p < 0.05$

Table B.7: Percentage of children satisfying life skills criteria by land ownership status of the household and school category.

Land ownership status	BRAC's NFPE	Formal	Remarks
Landless	85.7	67.6	$\chi^2 = 10.75$; $p < 0.01$
Landholder	87.7	69.6	$\chi^2 = 11.75$; $p < 0.001$
Remarks	$\chi^2 = 0.21$; ns	$\chi^2 = 0.11$; ns	

Note: ns = not significant at $p < 0.05$

Table B.8: Percentage of children satisfying life skills criteria by housing condition and school category.

Housing condition	BRAC's NFPE	Formal	Remarks
Poor	81.1	71.4	$\chi^2 = 1.00$; ns
Good	88.2	68.4	$\chi^2 = 22.57$; $p < 0.001$
Remarks	$\chi^2 = 1.80$; ns	$\chi^2 = 0.11$; ns	

Note: ns = not significant at $p < 0.05$

Table B.9: Percentage of children satisfying life skills criteria by yearly food security status of household and school category.

Yearly food security status	BRAC's NFPE	Formal	Remarks
Deficit	87.5	68.1	$\chi^2 = 8.75$; $p < 0.01$
Balance or above	86.2	69.0	$\chi^2 = 13.45$; $p < 0.001$
Remarks	$\chi^2 = 0.08$; ns	$\chi^2 = 0.02$; ns	

Note: ns = not significant at $p < 0.05$

Table B.10: Percentage of children satisfying life skills criteria by religion and school category.

Religion	BRAC's NFPE	Formal	Remarks
Muslim	87.4	68.0	$\chi^2 = 20.56$; $p < 0.001$
Non-muslim	82.9	70.6	$\chi^2 = 2.09$; ns
Remarks	$\chi^2 = 0.60$; ns	$\chi^2 = 0.15$; ns	

Note: ns = not significant at $p < 0.05$

Table B.11: Percentage of children satisfying life skills criteria by access to electronic media and school category.

Access to electronic media	BRAC's NFPE	Formal	Remarks
No access	71.1	48.6	$\chi^2 = 4.21$; $p < 0.05$
Radio or TV	84.8	64.4	$\chi^2 = 9.06$; $p < 0.01$
Both radio and TV	94.0	78.3	$\chi^2 = 11.93$; $p < 0.001$
Remarks	$\chi^2 = 15.01$; $p < 0.001$	$\chi^2 = 12.25$; $p < 0.01$	

Appendix VI.C

Reading skills and background characteristics

Table C.1: Percentage of children satisfying reading skills criteria by age and school category.

Age group (in year)	BRAC's NFPE	Formal	Remarks
10 - 11	90.3	68.2	$\chi^2 = 9.41$; $p < 0.01$
12 - 13	88.5	87.7	$\chi^2 = 0.30$; ns
14 - 16	86.5	92.1	$\chi^2 = 1.45$; ns
Remarks	$\chi^2 = 0.48$; ns	$\chi^2 = 18.07$; $p < 0.001$	

Note: ns = not significant at $p < 0.05$

Table C.2: Percentage of children satisfying reading skills criteria by current enrolment status and school category.

Current enrolment status	BRAC's NFPE	Formal	Remarks
Dropped out	81.4	60.9	$\chi^2 = 5.19$; $p < 0.05$
Currently enrolled	89.8	93.6	$\chi^2 = 1.64$; ns
Remarks	$\chi^2 = 2.45$; ns	$\chi^2 = 39.44$; $p < 0.001$	

Note: ns = not significant at $p < 0.05$

Table C.3: Percentage of children satisfying reading skills criteria by current grade in school and school category.

Current grade	BRAC's NFPE	Formal	Remarks
Nil*	81.4	60.9	$\chi^2 = 5.19$; $p < 0.05$
Fourth	88.3	90.2	$\chi^2 = 0.12$; ns
Fifth	91.0	92.9	$\chi^2 = 0.09$; ns
Sixth or more	100.0	95.1	$\chi^2 = 0.41$; ns
Remarks	$\chi^2 = 3.61$; ns	$\chi^2 = 39.97$; $p < 0.001$	

Note: * marked children dropped out after three years of schooling; ns = not significant at $p < 0.05$

Table C.4: Percentage of children satisfying reading skills criteria by siblings' education and school category.

Siblings' education	BRAC's NFPE	Formal	Remarks
No education	84.6	80.0	$\chi^2 = 0.33$; ns
Some education	89.4	85.0	$\chi^2 = 1.64$; ns
Remarks	$\chi^2 = 0.89$; ns	$\chi^2 = 0.63$; ns	

Note: ns = not significant at $p < 0.05$

Table C.5: Percentage of children satisfying reading skills criteria by mother's education and school category.

Mother's schooling	BRAC's NFPE	Formal	Remarks
No schooling	88.4	81.3	$\chi^2 = 3.18$; ns
Some schooling	88.0	87.5	$\chi^2 = 0.01$; ns
Remarks	$\chi^2 = 0.01$; ns	$\chi^2 = 1.75$; ns	

Note: ns = not significant at $p < 0.05$

Table C.6: Percentage of children satisfying reading skills criteria by father's education and school category.

Father's education	BRAC's NFPE	Formal	Remarks
Nil	88.1	78.8	$\chi^2 = 3.38$; ns
1 - 5 years	83.3	77.6	$\chi^2 = 0.55$; ns
6+ years	94.2	91.5	$\chi^2 = 0.37$; ns
Remarks	$\chi^2 = 3.07$; ns	$\chi^2 = 7.72$; $p < 0.05$	

Note: ns = not significant at $p < 0.05$

Table C.7: Percentage of children satisfying reading skills criteria by land ownership status of the household and school category.

Land ownership status	BRAC's NFPE	Formal	Remarks
Landless	87.3	79.0	$\chi^2 = 2.84$; ns
Landholder	89.5	88.1	$\chi^2 = 0.11$; ns
Remarks	$\chi^2 = 0.27$; ns	$\chi^2 = 3.67$; ns	

Note: ns = not significant at $p < 0.05$

Table C.8: Percentage of children satisfying reading skills criteria by housing condition and school category.

Housing condition	BRAC's NFPE	Formal	Remarks
Poor	84.9	78.6	$\chi^2 = 0.51$; ns
Good	89.3	84.9	$\chi^2 = 1.70$; ns
Remarks	$\chi^2 = 0.78$; ns	$\chi^2 = 0.74$; ns	

Note: ns = not significant at $p < 0.05$

Table C.9: Percentage of children satisfying reading skills criteria by yearly food security status of household and school category.

Yearly food security status	BRAC's NFPE	Formal	Remarks
Deficit	86.4	81.2	$\chi^2 = 0.78$; ns
Balance or above	89.5	85.4	$\chi^2 = 1.22$; ns
Remarks	$\chi^2 = 0.52$; ns	$\chi^2 = 0.65$; ns	

Note: ns = not significant at $p < 0.05$

Table C.10: Percentage of children satisfying reading skills criteria by religion and school category.

Religion	BRAC's NFPE	Formal	Remarks
Muslim	91.0	83.1	$\chi^2 = 5.09$; $p < 0.05$
Non-muslim	75.6	86.8	$\chi^2 = 2.21$; ns
Remarks	$\chi^2 = 7.77$; $p < 0.01$	$\chi^2 = 0.48$; ns	

Note: ns = not significant at $p < 0.05$

Table C.11: Percentage of children satisfying reading skills criteria by access to electronic media and school category.

Access to electronic media	BRAC's NFPE	Formal	Remarks
No access	82.2	68.6	$\chi^2 = 2.03$; ns
Radio or TV	92.4	84.4	$\chi^2 = 2.56$; ns
Both radio and TV	87.9	88.7	$\chi^2 = 0.03$; ns
Remarks	$\chi^2 = 2.92$; ns	$\chi^2 = 8.16$; $p < 0.05$	

Note: ns = not significant at $p < 0.05$

Appendix VI.D

Writing skills and background characteristics

Table D.1: Percentage of children satisfying writing skill criteria by age and school category.

Age group (in year)	BRAC's NFPE	Formal	Remarks
10 - 11	80.6	50.0	$\chi^2 = 13.17$; $p < 0.001$
12 - 13	82.7	67.1	$\chi^2 = 5.74$; $p < 0.05$
14 - 16	81.1	77.2	$\chi^2 = 0.38$; ns
Remarks	$\chi^2 = 0.13$; ns	$\chi^2 = 13.32$; $p < 0.001$	

Note: ns = not significant at $p < 0.05$

Table D.2: Percentage of children satisfying writing skill criteria by current enrolment status and school category.

Current enrolment status	BRAC's NFPE	Formal	Remarks
Dropped out	62.8	43.5	$\chi^2 = 3.95$; $p < 0.05$
Currently enrolled	85.8	76.0	$\chi^2 = 5.73$; $p < 0.05$
Remarks	$\chi^2 = 12.47$; $p < 0.001$	$\chi^2 = 23.43$; $p < 0.001$	

Table D.3: Percentage of children satisfying writing skill criteria by current grade in school and school category.

Current grade	BRAC's NFPE	Formal	Remarks
Nil*	62.8	43.5	$\chi^2 = 3.95$; $p < 0.05$
Fourth	82.0	51.2	$\chi^2 = 14.61$; $p < 0.001$
Fifth	91.0	71.4	$\chi^2 = 6.51$; $p < 0.05$
Sixth or more	87.5	87.3	$\chi^2 = 0.00$; ns
Remarks	$\chi^2 = 14.99$; $p < 0.01$	$\chi^2 = 40.84$; $p < 0.001$	

Note: * marked children dropped out after three years of schooling; ns = not significant at $p < 0.05$

Table D.4: Percentage of children satisfying writing skill criteria by siblings education and school category.

Siblings' education	BRAC's NFPE	Formal	Remarks
No education	78.8	62.5	$\chi^2 = 2.98$; ns
Some education	82.4	67.5	$\chi^2 = 11.47$; p<0.001
Remarks	$\chi^2 = 0.35$; ns	$\chi^2 = 0.38$; ns	

Note: ns = not significant at p<0.05

Table D.5: Percentage of children satisfying writing skill criteria by mother's education and school category.

Mother's schooling	BRAC's NFPE	Formal	Remarks
No schooling	81.6	55.5	$\chi^2 = 25.36$; p<0.001
Some schooling	82.0	79.5	$\chi^2 = 0.14$; ns
Remarks	$\chi^2 = 0.00$; ns	$\chi^2 = 15.48$; p<0.001	

Note: ns = not significant at p<0.05

Table D.6: Percentage of children satisfying writing skill criteria by father's education and school category.

Father's education	BRAC's NFPE	Formal	Remarks
Nil	79.9	51.8	$\chi^2 = 19.16$; p<0.001
1 - 5 years	77.8	63.3	$\chi^2 = 2.62$; ns
6+ years	90.4	80.2	$\chi^2 = 2.64$; ns
Remarks	$\chi^2 = 3.48$; ns	$\chi^2 = 17.47$; p<0.001	

Note: ns = not significant at p<0.05

Table D.7: Percentage of children satisfying writing skill criteria by land ownership status of the household and school category.

Land ownership status	BRAC's NFPE	Formal	Remarks
Landless	81.7	64.8	$\chi^2 = 8.59$; $p < 0.01$
Landholder	81.6	68.1	$\chi^2 = 5.84$; $p < 0.05$
Remarks	$\chi^2 = 0.00$; ns	$\chi^2 = 0.30$; ns	

Note: ns = not significant at $p < 0.05$

Table D.8: Percentage of children satisfying writing skill criteria by housing condition and school category.

Housing condition	BRAC's NFPE	Formal	Remarks
Poor	73.6	46.4	$\chi^2 = 5.88$; $p < 0.05$
Good	84.0	69.3	$\chi^2 = 11.70$; $p < 0.001$
Remarks	$\chi^2 = 2.97$; ns	$\chi^2 = 5.84$; $p < 0.05$	

Note: ns = not significant at $p < 0.05$

Table D.9: Percentage of children satisfying writing skill criteria by yearly food security status of household and school category.

Yearly food security status	BRAC's NFPE	Formal	Remarks
Deficit	79.5	55.1	$\chi^2 = 10.79$; $p < 0.001$
Balance or above	82.9	71.3	$\chi^2 = 6.02$; $p < 0.05$
Remarks	$\chi^2 = 0.42$; ns	$\chi^2 = 5.86$; $p < 0.05$	

Note: ns = not significant at $p < 0.05$

Table D.10: Percentage of children satisfying writing skill criteria by religion and school category.

Religion	BRAC's NFPE	Formal	Remarks
Muslim	85.9	63.4	$\chi^2 = 25.36$; $p < 0.001$
Non-Muslim	61.0	75.0	$\chi^2 = 2.38$; ns
Remarks	$\chi^2 = 14.14$ $p < 0.001$	$\chi^2 = 2.96$; ns	

Note: ns = not significant at $p < 0.05$

Table D.11: Percentage of children satisfying writing skill criteria by access to electronic media and school category.

Access to electronic media	BRAC's NFPE	Formal	Remarks
No access	73.3	42.9	$\chi^2 = 7.62$; $p < 0.01$
Radio or TV	83.5	65.6	$\chi^2 = 7.07$; $p < 0.01$
Both radio and TV	83.6	74.8	$\chi^2 = 2.74$; ns
Remarks	$\chi^2 = 2.57$; ns	$\chi^2 = 12.39$; $p < 0.01$	

Note: ns = not significant at $p < 0.05$

Appendix VI.E

Numeracy skills and background characteristics

Table E.1: Percentage of children satisfying numeracy skill criteria by age and school category.

Age group (in year)	BRAC's NFPE	Formal	None	NFPE vs Formal	Remarks NFPE vs None	Formal vs None
10 - 11	96.8	86.4	32.1	$\chi^2 = 4.41$ $p < 0.05$	$\chi^2 = 66.44$; $p < 0.001$	$\chi^2 = 48.11$; $p < 0.001$
12 - 13	97.1	95.9	70.8	$\chi^2 = 0.20$ ns	$\chi^2 = 22.84$; $p < 0.001$	$\chi^2 = 15.06$; $p < 0.001$
14 - 16	97.3	99.0	81.4	$\chi^2 = 0.74$ ns	$\chi^2 = 10.07$; $p < 0.01$	$\chi^2 = 17.84$; $p < 0.001$
Remarks	$\chi^2 = 0.03$; ns	$\chi^2 = 12.81$; $p < 0.01$	$\chi^2 = 51.62$; $p < 0.001$			

Note: ns = not significant at $p < 0.05$

Table E.2: Percentage of children satisfying numeracy skill criteria by current enrolment status and school category.

Current enrolment status	BRAC's NFPE	Formal	Remarks
Dropped out	97.7	84.1	$\chi^2 = 5.13$; $p < 0.05$
Currently enrolled	97.0	98.8	$\chi^2 = 1.52$; ns
Remarks	$\chi^2 = 0.06$; ns	$\chi^2 = 20.94$; $p < 0.001$	

Note: ns = not significant at $p < 0.05$

Table E.3: Percentage of children satisfying numeracy skills criteria by current grade in school and school category.

Current grade	BRAC's NFPE	Formal	Remarks
Nil	97.7	84.1	$\chi^2 = 5.13$; $p < 0.05$
Fourth	95.5	97.6	$\chi^2 = 0.34$; ns
Fifth	98.7	100.0	$\chi^2 = 0.36$; ns
Sixth and more	100.0	99.0	$\chi^2 = 0.08$; ns
Remarks	$\chi^2 = 2.02$; ns	$\chi^2 = 21.15$; $p < 0.001$	

Note: ns = not significant at $p < 0.05$

Table E.4: Percentage of children satisfying numeracy skill criteria by siblings education and school category.

Sibling's education	BRAC's NFPE	Formal	None	NFPE vs Formal	Remarks NFPE vs None	Formal vs None
No education	94.2	87.5	51.5	$\chi^2 = 1.29$; ns	$\chi^2 = 29.29$; $p < 0.001$	$\chi^2 = 16.48$; $p < 0.001$
Some education	97.9	96.0	64.5	$\chi^2 = 1.13$; ns	$\chi^2 = 62.42$; $p < 0.001$	$\chi^2 = 54.59$; $p < 0.001$
Remarks	$\chi^2 = 1.91$; ns	$\chi^2 = 4.74$; $p < 0.05$	$\chi^2 = 4.12$; $p < 0.05$			

Note: ns = not significant at $p < 0.05$

Table E.5: Percentage of children satisfying numeracy skill criteria by mother's education and school category.

Mother's schooling	BRAC's NFPE	Formal	None	NFPE vs Formal	Remarks NFPE vs None	Formal vs None
No schooling	96.3	93.8	56.6	$\chi^2 = 1.12$; ns	$\chi^2 = 85.98$; $p < 0.001$	$\chi^2 = 53.59$; $p < 0.001$
Some schooling	100.0	95.5	68.4	$\chi^2 = 2.30$; ns	$\chi^2 = 17.29$; $p < 0.001$	$\chi^2 = 15.52$; $p < 0.001$
Remarks	$\chi^2 = 1.40$; ns	$\chi^2 = 0.37$; ns	$\chi^2 = 1.01$; ns			

Note: ns = not significant at $p < 0.05$

Table E.6: Percentage of children satisfying numeracy skill criteria by father's education and school category.

Father's education	BRAC's NFPE	Formal	None	NFPE vs Formal	Remarks NFPE vs None	Formal vs None
Nil	96.3	91.8	56.2	$\chi^2 = 2.04$; ns	$\chi^2 = 64.57$; $p < 0.001$	$\chi^2 = 34.18$; $p < 0.001$
1 - 5 years	96.3	91.8	66.7	$\chi^2 = 0.93$; ns	$\chi^2 = 13.05$; $p < 0.001$	$\chi^2 = 7.42$; $p < 0.01$
6+ years	100.0	98.1	61.5	$\chi^2 = 0.99$; ns	$\chi^2 = 21.67$; $p < 0.001$	$\chi^2 = 27.98$; $p < 0.001$
Remarks	$\chi^2 = 1.99$; ns	$\chi^2 = 4.62$; ns	$\chi^2 = 1.06$; ns			

Note: ns = not significant at $p < 0.05$

Table E.7: Percentage of children satisfying numeracy skill criteria by land ownership status of the household and school category.

Land ownership status	BRAC's NFPE	Formal	None	NFPE vs Formal	Remarks NFPE vs None	Formal vs None
Landless	96.8	95.2	57.0	$\chi^2 = 0.39$; ns	$\chi^2 = 58.86$; $p < 0.001$	$\chi^2 = 46.09$; $p < 0.001$
Landholder	97.4	94.1	58.5	$\chi^2 = 1.59$; ns	$\chi^2 = 46.96$; $p < 0.001$	$\chi^2 = 41.27$; $p < 0.001$
Remarks	$\chi^2 = 0.06$; ns	$\chi^2 = 0.16$; ns	$\chi^2 = 0.05$; ns			

Note: ns = not significant at $p < 0.05$

Table E.8: Percentage of children satisfying numeracy skill criteria by housing condition and school category.

Housing condition	BRAC's NFPE	Formal	None	NFPE vs Formal	Remarks NFPE vs None	Formal vs None
Poor	96.2	92.9	56.6	$\chi^2 = 0.44$; ns	$\chi^2 = 26.32$; $p < 0.001$	$\chi^2 = 12.66$; $p < 0.001$
Good	97.3	94.8	58.2	$\chi^2 = 1.63$; ns	$\chi^2 = 77.60$; $p < 0.001$	$\chi^2 = 70.44$; $p < 0.001$
Remarks	$\chi^2 = 0.18$; ns	$\chi^2 = 0.18$; ns	$\chi^2 = 0.06$; ns			

Note: ns = not significant at $p < 0.05$

Table E.9: Percentage of children satisfying numeracy skill criteria by yearly food security status of household and school category.

Yearly food security status	BRAC's NFPE	Formal	None	NFPE vs Formal	Remarks NFPE vs None	Formal vs None
Deficit	94.3	98.6	53.3	$\chi^2 = 1.88$; ns	$\chi^2 = 41.38$; $p < 0.001$	$\chi^2 = 42.72$; $p < 0.001$
Balance or above	98.7	93.0	61.9	$\chi^2 = 6.31$; ns	$\chi^2 = 62.64$; $p < 0.001$	$\chi^2 = 42.70$; $p < 0.001$
Remarks	$\chi^2 = 3.75$; ns	$\chi^2 = 2.98$; ns	$\chi^2 = 1.81$; ns			

Note: ns = not significant at $p < 0.05$

Table E.10: Percentage of children satisfying numeracy skill criteria by mothers' education and school category.

Religion	BRAC's NFPE	Formal	None	NFPE vs Formal	Remarks NFPE vs None	Formal vs None
Muslim	98.5	93.6	59.6	$\chi^2 = 6.07$; $p < 0.05$	$\chi^2 = 91.77$; $p < 0.001$	$\chi^2 = 58.30$; $p < 0.001$
Non-Muslim	90.2	97.1	40.7	$\chi^2 = 2.28$; ns	$\chi^2 = 19.22$; $p < 0.001$	$\chi^2 = 39.91$; $p < 0.001$
Remarks	$\chi^2 = 8.17$; $p < 0.01$	$\chi^2 = 1.13$; ns	$\chi^2 = 3.50$; ns			

Note: ns = not significant at $p < 0.05$

Table E.11: Percentage of children satisfying numeracy skill criteria by access to electronic media and school category.

Access to electronic media	BRAC's NFPE	Formal	None	NFPE vs Formal	Remarks NFPE vs None	Formal vs None
No access	97.8	94.3	56.8	$\chi^2 = 0.67$; ns	$\chi^2 = 24.37$; $p < 0.001$	$\chi^2 = 16.20$; $p < 0.001$
Radio or TV	96.2	94.4	55.0	$\chi^2 = 0.29$; ns	$\chi^2 = 36.45$; $p < 0.001$	$\chi^2 = 36.00$; $p < 0.001$
Both radio and TV	97.4	94.8	61.5	$\chi^2 = 1.07$; ns	$\chi^2 = 41.00$; $p < 0.001$	$\chi^2 = 32.19$; $p < 0.001$
Remarks	$\chi^2 = 0.34$; ns	$\chi^2 = 0.02$; ns	$\chi^2 = 0.66$; ns			

Note: ns = not significant at $p < 0.05$