

Preschool education in sub-Saharan Africa

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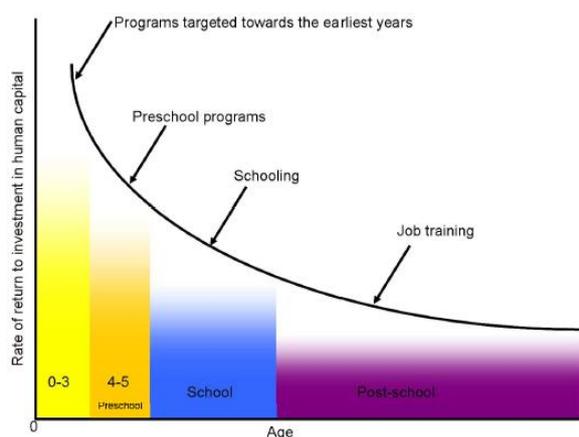
Introduction

Early childhood education has recently received increased attention among policy makers based on the research findings of two different disciplines – neuroscience and economics.

- According to neuroscience, cognitive, emotional and social behavior is formed very early in life. Brain synapses are formed in the first few years of life. Brain scans have shown abnormal development for children who have been maltreated in very young ages.
- According to economics, interventions at early ages are more cost-effective than interventions later in life and are associated with high rates of return and cost-benefit ratios.

Much of the related research has been compiled and disseminated by economics Nobel Laureate James Heckman and illustrated in a famous graph.

FIGURE 1. HECKMAN’S SUMMARY OF PRIORITY INVESTMENTS



Source: Heckman (2008)

More recent research has confirmed the importance of investing in preschool (e.g., Gertler et al., 2014). “Preschool” is defined as programmes at ISCED level 0, comprising the initial stage of organized instruction are designed primarily to introduce very young children to a school-type environment.

Cost-benefit analysis of investments in early childhood require a follow-up of children who have attended preschool to adult life and comparison of their earnings to a control group of children who have not attended preschool. Longitudinal tracing over several decades is a tall-order research design, hence the scarcity of cost-benefit estimates in the literature.

Most of the research has been conducted in the United States showing typical results in Table 1.

TABLE 1. RATE OF RETURN AND BENEFIT-COST RATIOS OF PRESCHOOL PROGRAMS IN THE UNITED STATES

Preschool program	RoR	BCR (3% rate)
Chicago parent-child	18	6.9
High Scope Perry	10	7.2
Abecedarian	7	2.7

Source: Wall Street Journal (2013), p. A2; Temple and Reynolds (2007).

Table 2 presents benefit-cost ratios of preschool programs in Africa. Preschool programs typically contain a nutrition element and affect lifetime earnings through better health, reduced grade repetition, higher educational attainment, increased cognitive skills and adult earnings.

TABLE 2. BENEFIT-COST RATIOS OF PRESCHOOL PROGRAMS IN AFRICA

Country (discount rate)	BCR	Source
Kenya (6%)	50.6	Orazem et al. (2008)
Sub-Saharan Africa (5%)	28.0	Psacharopoulos (2018)

Preschool in sub-Saharan Africa

Data on preschool coverage in sub-Saharan Africa are scarce and conflicting between sources. The UNESCO Institute of Statistics database has dots, meaning missing values, for many countries in the region. The World Bank database gives a more complete picture of preschool coverage as in Table A-1 in the Annex.

Scaling-up preschool

According to the latest data, preschool enrollment in sub-Saharan Africa covers 32% of the age group corresponding to 24m students (UNESCO, 2019). The Africa Union Agenda target year is 2063. By that time, sub-Saharan African countries could have 39m preschoolers corresponding to the 52% enrolment ratio of now middle-income countries in the region. This would require a significant expansion of the school system raising the question on its cost-effectiveness.

Cost

The cost of preschool in the literature varies enormously between estimates, from a few dollars to the thousands. We \$119 per preschool student/year as estimated in a Nigerian study (Ogunyinka, 2013). This cost includes tuition fees, learning materials, uniforms, accessories, school lunches, transportation, sports and health care. We assume a two years preschool duration. The resource cost is all inclusive, in the sense that there are no foregone earnings for that age group.

Benefits

The benefits side is even trickier, as there are no studies in sub-Saharan Africa that have followed preschool children to adulthood and compare their earnings to children of similar ages who have not attended preschool. Thus we use a 16% earnings increment that is an average of the 25% earnings increment reported in Gertler et al. (2014) for Jamaica, and 7% in the United States (Chetty et al., 2011).

The earnings increment is applied to average labor earnings of \$1258 that is 80% of average income in sub-Saharan Africa (World Bank, 2019c), yielding \$201 per preschool graduate. We assume that earnings would start at the age of 20.

Cost-benefit

The attached spreadsheet shows the calculations resulting in a cost-benefit ratio of 7 using 5% discount rate, and a 13% internal

rate of return on the preschool investment, (Annex 2).

Making a further assumption that earnings would grow over time at an annual rate of 2.4%, as estimated by the World Bank (2019b), the benefit-cost ratio increases to 16.

Thus, the return on preschool investment in sub-Saharan Africa ranges from a low benefit-cost ratio of 7 to a high of 16.

Qualifications

Today, there is there broad academic consensus regarding the socio-economic benefits accruing from an intervention of the above type. However, several qualifications are in order.

The above calculations were based on strong assumptions regarding the costs and benefits of the investment. They also raise a flag for the need of better education statistics in the region and evaluation of interventions.

One risk is quality. Expanding education is not just infrastructure, but getting the right teachers in place. Where do the teachers come from? What would be their training?

Another risk is affordability and sustainability. Preschool may be relatively low cost, but do the governments have adequate funding not just for the initial investment, but for the recurrent costs? Governments should be encouraged to adequately budget for it

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Annex

TABLE A-1 . GROSS PRESCHOOL ENROLLMENT IN SUB-SAHARAN AFRICA (%)

Country	Year	Preschool enrollment ratio (%)
Chad	2016	1
Central African Rep.	2017	3
Burkina Faso	2017	4
Congo, Dem. Rep.	2015	4
Mali	2017	5
Guinea-Bissau	2010	7
Cote d'Ivoire	2017	8
Niger	2017	8
Zambia	2016	8
Mauritania	2015	10
South Sudan	2015	10
Mozambique	1986	11
Sierra Leone	2017	12
Congo, Rep.	2012	13
Burundi	2017	14
Uganda	2017	14
Eritrea	2017	15
Guinea	2011	15
Senegal	2017	16
Botswana	2014	20
Comoros	2017	20
Rwanda	2017	21
Togo	2017	21
Benin	2016	25
Eswatini	2011	25
South Africa	2016	25
Ethiopia	2015	30
Lesotho	2016	33
Namibia	2017	33
Gabon	2011	35
Cameroon	2017	37
Madagascar	2017	38
Gambia, The	2017	39
Angola	2016	40
Nigeria	2010	42
Tanzania	2017	42
Zimbabwe	2013	42
Equatorial Guinea	2015	43
Sudan	2017	47
Sao Tome and Principe	2016	51
Cabo Verde	2017	71
Kenya	2016	77

Malawi	2015	81
Seychelles	2017	100
Mauritius	2017	101
Ghana	2017	115
Liberia	2016	157
Sub-Saharan Africa average	Latest year	32

Source: World Bank (2019a)