

**Human Capital Outcomes in South Africa: The Role of Primary and  
Secondary Schooling Institutions**

*Proposal Submission to SISERA Research Competition under the SAGA Programme*

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## Introduction

The availability of education-related data sets has encouraged a growing body of work on the economics of education in South Africa. Much of this work, within the economics fraternity has focused on the impact of schooling inputs on variously measured outputs<sup>1</sup>. In addition, more generally the work of labour economists have almost exclusively been ensconced within an earnings function framework, usually as two-stage labour supply models<sup>2</sup> within the broader tradition of private rates of return to the quantity of human capital accumulated. These labour market studies cannot, and indeed are not designed to, accurately reflect on the various factors impacting on schooling outcomes in South Africa. The latter remains the point of departure of this study: namely an attempt, through the use of as yet relatively unexploited education datasets in the country, to explore how the characteristics of the schooling system have had an effect on immediate and medium-term educational outcomes. We intend to use the corpus of initial work on schooling outcomes as a basis for a more thorough investigation of the linkages between inputs and outputs in the South African schooling system.

## Project Objectives

This study will, over a two-year period, examine the under-used educational datasets, in combination with relevant household survey data, available in the country to:

- Provide a descriptive overview of firstly, resource characteristics by type of school, commonly referred to as ‘school effects’ and secondly an overview of the ‘person and family effects’ that are available from complementary data sets, at the magisterial district level. Typology of school could be characterised by, for example, magisterial district, province, main race of attendees, mean income in region and so on. Resource characteristics to be examined include access to utilities; road access; class size; pupil-teacher ratios; telecommunications and teacher qualifications. The ‘person effects’ data would be formulated as a parallel to schooling resources data outlined above and would include variables such as mean household income, household size, employment and unemployment rates and dominant race in a given magisterial district.
- Provide a descriptive overview of three forms of educational outcomes, namely enrollment levels, aptitude tests and matriculation pass rates. Enrollment levels in the schooling system will be analysed on the basis of race, gender, age and location. Schooling aptitude tests that have been undertaken in South Africa, will provide an initial analysis of determinants of variance in achievement in the schooling system in South Africa. Finally, matriculation (Grade 12) pass rates will be examined across all schools nationally, to provide an initial analysis of the determinants of variance in pass rates.
- Undertake educational production function estimates that attempt to separate out the impact of ‘school effects’ as opposed to ‘person or family effects’ in the determination of schooling outcomes. The latter will be variously measured by

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<sup>1</sup> See Burger & van der Berg (2002); Case & Deaton (1999); Case & Yogo (1999); Crouch & Mabogoane (2001); Anderson, Case & Lam (2001); Seekings (2002).

<sup>2</sup> For example see Mwabu & Schultz (1996); Bhorat & Leibbrandt (2000); van der Berg & Chamberlain (2002).

test scores, enrollment rates and matric pass rates, while the independent variables – the school and person & family effects – are derived from the descriptive overview alluded to above.

- Provide an empirical overview of distributional equity in the schooling system, by focusing on three variables: schooling expenditure commitments, average pupil-teacher ratios and an index of quality of teachers. This overview will be done according to a variety of institutional and socio-economic variables such as former (*apartheid*) educational department of school, mean household income in district, unemployment and employment rates in district and so on. Importantly, this analysis will be undertaken inter- as well as *intra-provincially*. Linked to the empirical overview, we will then provide measures of this distributional equity drawing on the standard measures of income inequality, namely the coefficient of variation, the Gini and the Theil indices.
- Provide an initial programme evaluation analysis of the effectiveness of the schooling system in producing their required outcomes.

## Research Methods

Despite the onset of democratic rule in South Africa since 1994, enormous welfare backlogs remain, particularly within the area of service provision. Indeed, the bedrock of post-apartheid economic policy, has been based on increasing the provision of services such as water, housing, electricity and of course education - to vulnerable individuals and households in the society<sup>3</sup>. This is the policy background, within which this study locates itself: that in the broader policy emphasis on micro-interventions, we intend to delineate the parameters of a research programme examining the role of education in welfare enhancement in the society.

While allocations to higher education are vested with the national government, schooling expenditure remains a provincial competence<sup>4</sup>. South Africa, despite these enormous backlogs in education remains yields very large fiscal commitment to education in general and schooling in particular. In the budget year 2001/02 the expenditure on schooling, as is made clear in the table below, exceeded other expenditure on service provision as a proportion of total provincial expenditure. Hence, the emphasis, in pure aggregate terms on schooling expenditure at the provincial level is amply clear. The problem, in the South African context, is that the distribution of this expenditure continues to be disproportionately toward historically white schools. This arises both as a result of the high costs that would be required for parity in spending and significant white opposition to significant redress in expenditure (van der Berg,2001).

### Consolidated Provincial Expenditure According to Function: 2001/02 (RSA,2002)

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<sup>3</sup>The early part of the post-1994 period was dominated by the focus on ensuring macroeconomic stability and the pursuance of an austere fiscal and monetary policy. With the establishment of this framework, through government's Growth, Employment and Redistribution (GEAR) strategy, the emphasis in policy has shifted to these micro-interventions designed to increase welfare-enhancing service delivery to the poor.

<sup>4</sup> South Africa has nine provinces, which are similar to states in the USA, but although their powers are expansive in terms of expenditure allocations, they are very limited in terms of revenue-raising.

<b>Function</b>	<b>R million</b>	<b>Share</b>
<b>Education</b>	47 243	0.39
<b>Health</b>	30 731	0.25
<b>Welfare</b>	23 843	0.19
<b>Housing &amp; Community Development</b>	5 398	0.04
<b>Other</b>	15 184	0.12
<b>Total expenditure</b>	122 399	1.00

Research thus far has therefore concentrated on two key aspects of the schooling system in South Africa. Firstly, the extent to which resource commitments to schools, particularly disadvantaged schools, have translated into altering outcomes. Secondly, relatively new research has tried to determine the degree and extent of fiscal redress that has occurred within each of the provinces' schooling systems. We will attempt therefore to unfold a research programme that deals separately, and hopefully fairly exhaustively, with both of these research themes.

#### **Educational Production Functions**

In terms of the first of these themes, the policy debates around investment in schooling, have focused on the degree to which (measurable) quality of schooling is in fact a key determinant of schooling outcomes. Hence, the debate has centred on the association between school effects, person or family effects and then ultimately the management of school resources – in determining schooling outcomes (Crouch & Mabogoane, 2001). International evidence for the developed world largely, has indicated that school quality is a less significant determinant of schooling outcomes than person or family effects (Hanushek *et al*, 1996; Hanushek, 1996). In contrast, this thesis has been provisionally challenged for developing countries (see for example, Heynemann & Loxley, 1983). The growing body of South African work, also begins to challenge this hypothesis, although the research is still in its early stages. It is clear though that the combination of quality of schooling, person and family effects and management of schooling resources are all key determinants that affect schooling outcomes. The first intention of this study is therefore to try and model the effect of these various independent variables on outcomes in the schooling system.

A useful theoretical point of departure is to utilise a production function approach. Hence education output (measured in different ways) can be viewed as a function of a number of inputs. Specifically:

$$O = f(S, X)$$

where  $O$  is some measure of educational output or outcomes,  $S$  is the vector of school characteristics or resources and  $X$  is a vector of person or family characteristics relevant to the school in attendance. In the context at hand,  $O$  can be measured by enrollment rates, test scores or pass rates. The vector  $S$  would include variables such as building structure of school; electricity access; water access; textbook incidence; computer incidence; pupil-teacher ratios; class size; classroom language; subjects on offer and so on. The vector  $X$  would include variables such as mean household income, employment

and unemployment rates, education of mother and father, household expenditure on education, household size, first language in household and dominant race in district. All these data would be measured according to magisterial district, given that this would be the spatial unit of analysis in the relevant education data sets.

The outcome measures and the school effects data would be derived from the education datasets, while the person and family effects data would be drawn from household survey data and Census data. Hence, the exercise will involve combining data from schools with household survey data. As we indicate in the datasets discussion below, South Africa has a wealth of schooling data, where for example through one of the databases listed below we have information on school characteristics for 27 000 schools across all nine provinces. In terms of the person and family effects data, we would need to derive possibly cluster means or medians at the magisterial district level. Hence, these household survey data would be matched according to the specific magisterial district that a school is located in. The details of the different data sets are expanded on below, but clearly a matching process with the survey and school data sets would be required. Ultimately though, the formulation above would yield a linear production function estimation equation that takes the following form:

$$O_{ij} = \alpha + \beta_1 S_{ij} + \beta_2 X_j + \varepsilon_{ij}$$

where,  $O_{ij}$  represents the outcome measure (pass, enrollment rates or standardized test scores) in school  $i$  and magisterial district  $j$ . The school effects ( $S_{ij}$ ) are obtainable by school and magisterial district, while the person and family effects,  $X$ , would be measured according to magisterial district  $j$ . We would then, through the use of national schooling and census (or household survey) data, attempt to estimate the extent to which the various forms of schooling outcomes are impacted on by schooling resources, as opposed to family or person effects. One would assume that much of the residual,  $\varepsilon_{ij}$ , would be explained by the measurement error in  $O_{ij}$ , as well as omitted variables or measurement error in the independent variables, which would include for example quality of the management of schooling resources as well as unmeasured person and family effects (Rubenstein *et al*, 1999 and Glewwe, 2002).

An important component of the study is the use of different measures of outcomes. In using enrollment rates, matric pass rates and a standardized test, we are variously measuring how the independent variables impact on entry into school, pupil performance while in attendance and final completion rates. In theory, these are all inter-linked, nested measures of schooling outcomes, although the data does not permit a uniform, integrated modeling procedure. However, a comparison of the three estimation equations, would hopefully shed light on the strength of school effects versus person and family effects in shaping each of these different schooling outcomes. For example, one may find that person and family effects are extremely important in determining enrollment rates, but reduce in importance relative to school effects when considering pass rates or test scores. This kind of information, currently not available, would of course be invaluable in policy formulation.

It bears mentioning that much of the research published in this area has either a different focus, for example in measuring returns to education as the outcome (Case & Yogo,2000), or has used older data sets (Case & Deaton,2000), or have focused on provincial, rather than national data (Crouch & Mabogoane,2001; Burger & van der Berg,2002). In almost all the relevant studies as well, the modeling of person and family effects has been limited. Hence, by focusing on a number of non-labour market outcomes, on the basis of recent national datasets, with a well-defined set of person and family effects, this study hopes to deliver a more nuanced assessment of the linkage between inputs and outputs in the South African schooling system<sup>5</sup>.

#### *Methodological Concerns*

There remain a number of methodological concerns in this paper, that we will allude to briefly here. We raise these in the context of what theoretically at least, may arise as problematic during the course of the production function analysis. At the outset it should be noted that the type of data we have at our disposal is slightly different to that used for most developing country studies focusing on the determinants of schooling outcomes (see excellent studies by Glick & Sahn,2000 and Glewwe & Jacoby,1994). In most similar studies for developing countries, the data is culled from household surveys to estimate for example, the effect of household and person effects on grade attainment (Glick & Sahn, 2000). In the study proposed here, we will utilize data on schooling characteristics from school databases compiled by the national Department of Education (see section on Data sets below). Hence, the idea would be to combine data on specific schools from school databases with person and household characteristics from Census and household survey data for the magisterial district that the particular school is located in<sup>6</sup>.

As such though, we are still beset with a series of estimation problems that are common in these production function analyses. These can be readily grouped, following Glewwe (2002) under problems of omitted variable bias, sample selection bias and measurement error. These econometric difficulties are all encountered in various ways when trying to estimate an educational production such as that outlined above.

Omitted variable arises when in the available data, we may only have some measures for school, person and household characteristics. If these omitted variables are correlated with the existing independent variables, then the coefficients derived would be biased upward or downward, depending on the sign of the correlation. For example, if we have measures for pupil-teacher ratios or qualification of teachers, but no teacher or school quality variables (such as the ‘skill’ of a math teacher or the ‘learning culture’ at a school), this omitted variables problem would result in coefficients which overestimate

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<sup>5</sup> One additional value-added from the proposed research programme, is that the estimation of the production function on the test score data, would add South Africa to the recent international comparative study undertaken by Hanushek & Luque (2001) on the impact of school and non-school effects on the Third International Mathematics and Science Study (TIMSS) test results for about 40 countries in three different age cohorts, where South African results are not represented.

<sup>6</sup> In terms of the estimation, what this means is that the person and family effects would effectively be means for a cluster of schools, given that more aggregated data is being used. This will no doubt impact on the interpretation of the results, which will ensure is detailed accordingly.

the contributions of these variables on the outcome variable<sup>7</sup>. The more obvious omitted variable bias arises from the exclusion of an appropriate measure for innate ability of students. It is likely therefore that the omission of innate ability of students and other such unobservables will again bias the impact of the measured, observable independent variables in our regression (see Hanushek, 1979)<sup>8</sup>. It is possible however, that in the aggregate model proposed here, if innate ability is randomly distributed in the population the averages across schools and magisterial districts, are likely to cancel out the individual effects.

Sample selection problems in this particular case arise from the fact that children in developing countries often enter school late (although this not as big a problem in South Africa), remain longer than normal due to grade repetition and drop out early – the latter two being significant problems in South Africa. Hence the sample we often work with in these studies, may not be a random, unbiased estimation of the underlying population. The, now widely available selection bias correction techniques, pioneered of course by Heckman can be utilized to correct for these sources of sample selection bias, should we view it as a significant problem in the model. We would also endeavour, to gather all information available on drop-out and repetition rates specifically, and incorporate these into our estimation.

Measurement error in the explanatory variables is a final category of estimation difficulties. Hence, we could find that there are errors in measuring school effects, as well as individual and household effects. Random measurement error will underestimate the true impact of the independent variables, while nonrandom measurement error can cause either underestimation or overestimation (Glewwe,2002)<sup>9</sup>.

In part overlap with the above concerns, one of the critical measurement difficulties will be that of an appropriate indicator for the quality of teachers. This is a generic problem in this area, as a robust indicator is almost always never available in the data. We will thus firstly recognize that such an indicator will be punctuated with measurement error, and then proceed to provide indicators of teacher quality on the basis of the available data. This may, for example, relate to the educational level of teachers and their years of experience, although we accept that these are crude measures.

The above concerns suggest that one has to be extremely careful when modeling the impact of school, person and household characteristics on any given schooling outcome. Fortunately, we are able to draw on the rigour of some of the studies on developing countries, quoted above, to correct for some of these difficulties. We would hope, in this

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<sup>7</sup> Often then, the quality of the school becomes endogenous, as parents search for better quality schools to send their children to, or more motivated children are likely to choose higher quality schools. Attendant problems then arise around causation, where for example higher quality teachers may choose schools with more motivated students, hence reversing the causality from school quality to achievement (Hanushek,1979).

<sup>8</sup> The innate ability of teachers is of course also another source of omitted variable bias.

<sup>9</sup> Measurement error can also arise from the outcome variable, with standardized test scores typically being problematic in terms of their accuracy.

study, to utilize some of these techniques in order to ensure that carefully constructed models are derived and robust estimates derived.

### **Measuring Fiscal Redress in Education**

The second major segment of the research programme would focus on the trends in the key elements of redress in the schooling system. The variables we have chosen as markers of this redress are of schooling expenditure, pupil-teacher ratios and an index of the quality of teachers. Thus far, most measures of fiscal redress have focused on these measures at the provincial level, without any analysis of their variation within provinces (see for example Ladd & Fiske, 2002). This will be a key contribution of the proposed study: namely to analyse elements of redress and their variation intra-provincially.

The descriptive component of this theme would try and present an overview of mean and median measures of schooling expenditure, pupil-teacher ratios and quality of teachers across appropriate spatial units both between and within each of the country's nine provinces. These measures would then be presented according to a set of socio-economic variables, drawn from the Census or household survey data, and tabulated by magisterial district, which would include for example, mean household income, dominant race group in area, unemployment rates in district, average household size and so on.

Of course the descriptive statistics would be a first step in indicating the degree and extent of inequity in schooling resources within provinces. More succinct measures of distributional inequity though would be required. We propose therefore to rely on the measures of inequality normally reserved for income inequality analysis, to inform our analysis of schooling resource equity. Various measures of distributive inequality are of course available, such as the coefficient of variation, the standard deviation of logarithms, the Gini coefficient and the Theil entropy measures. The general approach here, would be to present more succinct and informative measures of distribution of between- and within-province schooling resources, through these inequality parameters. Hence, in principle, the idea would be to derive for example, Gini measures for the inequality in pupil-teacher ratios between and within each of the provinces. In the latter case then, one would immediately have a sense of the inequities within each of the provinces in this particular schooling resource indicator. One particularly pertinent application of the inequality measures to schooling, is the Theil entropy index. Taking the Theil-T measure:

$$T = \frac{1}{n} \sum_i \frac{y_i}{y} \log \left( \frac{y_i}{y} \right)$$

where  $y_i$  is the income of the  $i^{\text{th}}$  cohort and  $\bar{y}$  is the mean income for the aggregate sample,  $n$ . Following from the above, we can derive the between- and within-group contributions to overall inequality,  $T$ . Specifically:

$$T_B = \sum_i q_i \log \left( \frac{\bar{y}_i}{\bar{y}} \right) \text{ and}$$



$$T_W = \sum_i q_i T_i$$

where  $T_i$  is the Theil-T inequality measure within the  $i$ th group,  $q_i$  is usually the proportion of income accruing to the  $i$ th group and  $T_B$  is the between group contribution and  $T_W$  is the within-group contribution.  $T_B$  is calculated the same way as  $T$ , but assuming that all incomes within a group are equal. Now, if one applies this measure to say the distribution of schooling expenditure between and within provinces, the measure becomes extremely valuable. Using the Theil-T measure together with data on the expenditure per school across all schools in the national sample, it is possible to determine whether the inequality in schooling expenditure is driven by the inequality between provinces, or the inequality within provinces. In the above formulation then,  $q_i$  above would represent the proportion of schooling expenditure by province  $i$ . This kind of information is critical for policy formulation, as it indicates as a starting point, the degree to which national government (which decides on allocations to the province) or the provinces themselves are responsible for the observed inequity in the schooling expenditure.

## Data Sets

The empirical foundation of this proposed research project, as has been made clear above, is the under-utilised data sets that cover the institutional and infrastructural facets of the schooling and HDI system in South Africa. In addition, we hope to match these various data sets with the Census 1996 and 2001 and where possible the national household survey data, in order to derive person and family effects data. Specifically, the data sets that we hope to use in the study include:

- Schools Register of Needs Survey (SRN)
- Education Management Information Systems (EMIS)
- PERSAL
- Third International Mathematics and Science Study (TIMSS)
- Census 1996
- Labour Force Surveys and October Households Surveys

Briefly, each of the data sets offer the following kind of information:

### SCHOOL REGISTER OF NEEDS SURVEY

The School Register of Needs Survey was conducted in 1996/7 and again in 2000. The following information is contained in the 1996/7 survey: Location (magisterial district, coordinates, rural/urban); Type of institution; Staff (academic/support, subsidised/unsubsidised); Pupils; Area and number of classrooms/rooms, by type; Condition of buildings; Telecommunications; Language; Furniture and Equipment; Provision of resources; Access to water, electricity, sanitation, roads; Organised sport; Other improvements; Platooning.

The SRN 2000 covers more than 27 000 education institutions in all 9 provinces (Mpumalanga conducted its own survey). Aside from the information already included

in the 1996/7 survey, the more recent survey collects information on criminal incidents at the schools. 390 special needs schools were also surveyed in depth in the 2000 survey.

#### **EDUCATION MANAGEMENT INFORMATION SYSTEMS (EMIS)**

The EMIS was initially established to systematically collect and analyse data on learners, educators and resources at schools in particular. However, this work has since expanded to include data on other types of institutions in the GET, FET and HE sectors. The EMIS includes data from the Western Cape's Annual Survey and the SNAP surveys conducted in the remaining provinces, and possibly data from the 1996 Census (although this is unclear). Data on other educational institutions is obtained from various other sources.

Due to the nature of the EMIS data, it is likely that schools will be identifiable, at least in terms of magisterial district or circuit. Various education indicators are calculated from the data, such as learner-educator ratios, gross enrolment ratios, and gender parity indices. Data includes enrolment of learners, number of educators, subjects offered by gender, grade, location, and also contains information on independent schools. EMIS data is likely to prove useful in the identification of poor and deprived schools.

#### **PERSAL**

PERSAL is the existing Human Resources system for Government with a fully integrated Human Resources and Payroll Functionality. PERSAL is a decentralized system that is run off 4 mainframes throughout the country. There are 30 different types of appointments with various conditions of service for each one e.g. permanent personnel, temporary teachers, sessional employees, etc. The various departments have different pay dates and these are accommodated by means of 50 different pay groups. PERSAL electronically interfaces with different financial systems that are in use in Government e.g., financial institutions, pension funds and medical schemes.

PERSAL is an enormous database and has detailed information on salaries, deductions, fringe benefits, medical aid schemes and even curriculum vitae. It also contains establishment detail. Establishment detail is particular to an organisation on Persal and contains the organisations structure, substructure and posts on the establishment. The establishment is the main driving tool in administering the work force of the organization

#### **THIRD INTERNATIONAL MATHEMATICS AND SCIENCE STUDY (TIMSS)**

The TIMSS was launched in 1994 and covers 41 countries around the world, with South Africa the only African country represented. The Human Sciences Research Council (HSRC) in South Africa conducted the TIMSS among 15 000 students from more than 400 primary and secondary schools. In 1998, the TIMSS was repeated and is designated the TIMSS-R, although the sample size for the latter was smaller, at about 8000 pupils in total. While these test score results have published in comparison with other countries in the study (Howie,2001), no work has been done to combine these outcome measures through educational production functions.

#### **CENSUS 1996 AND 2001**

The Census has a magisterial district number and areas could be linked across datasets with this. Also then all demographic and household information is available. A number of questions are asked in detail about area, occupation and qualification. Regarding education there are questions on educational level attained, highest qualification and whether someone is presently in schooling, which can inform enrollment rate questions.

#### **LABOUR FORCE SURVEYS AND OCTOBER HOUSEHOLD SURVEYS**

The October Household Surveys (OHSs) have run from 1994 through to 1999 and are nationally representative surveys of about 30 000 households. The Labour Force Surveys (LFSs) began in 2000 and are run twice a year. Both surveys contain very detailed demographic, labour market and welfare-related data. Their small sample size though may militate against extensive usage in the matching process with the education data sets.

In terms of the project objectives, it is important to note that the preparation and alignment of the datasets will require a significant quantum of careful and rigorous thinking. The fact, for example, that the TIMSS data may provide an outcome measure,  $O_{ij}$ , but that the schools in this sample are not fully matched with the SRN database, will make it extremely difficult to combine these data sets in the analysis. However, there are a number of avenues to pursue. For one, the EMIS data is the most exhaustive of those identified above (although it suffers the problem of being very difficult to manipulate) and could then serve as the starting point for the dependent variable measure, with the SRN survey serving as the school effects data set. However, it is clear that while these data difficulties are not insurmountable, we will certainly be required to make compromises of this sort during the course of the project.

#### **Application of Research Results**

As in the tradition of most of the DPRU's research, the research results will be fed into the ongoing policy debates around education policy in South Africa. Consequently, specific attempts will be made to engage with the national Department of Education (DoE) and its various policy bodies such as the Centre for Higher Education (CHE), which the DPRU has a close link with. In addition, given that the research will also be academically rigorous, the results will be shared with the local and (through the SISERA-Cornell University link) international research community.

The *modus operandi* of the above would be a deliberate dissemination strategy that has three focal areas: Firstly, the publication of the research results as part of the DPRU working paper series. Secondly, working papers deemed to be rigorous enough, will be submitted to accredited journals. Thirdly, the ongoing results from the project would need to be popularised. In order to achieve this, there are two basic avenues – the media and populist journals. In terms of the media, relevant and important information will be sent to daily or weekly newspapers in order to engage readers with the issues raised within the project. This avenue has already been proven to be very effective, in other projects within the DPRU. The dissemination of results in populist journals is a reference to publications such as the South African Labour Bulletin (SALB) and the Trade and Industry Monitor where the readership offers the advantage of a wide circulation across

the entire spectrum of individuals and institutions interested in general economic issues. Populist education-related publications would also be accessed as an outlet for the research.

Finally, the DPRU holds an annual conference on labour market and poverty issues each year. This has now been running for three years. We would expect that the results of this project would be presented at this national conference, where the audience is made up of local and international researchers together with local policy makers.

### Anticipated Impacts

We would hope - through this rigorous analysis of schooling outcomes as well as the progress, or lack thereof, made in terms of redress – to contribute to the debate around the distribution of government expenditure on schooling and the impact of differential factors on schooling outcomes. Thus far, the policy debate has for too long been focused on fairly subjective and perhaps less tangible aspects of the schooling system. Given the paucity of hard empirical work on the schooling system in South Africa thus far, there can be no doubt that one of the key anticipated impacts of the research would be to inject some notion of measurement of government performance and schooling performance into the debate.

### Project Timelines

It is intended that this project run for two years, starting in June 2003 and ending in May 2005. Throughout the course of the project, outputs drawn from the project will be delivered in the form of, in the first instance, DPRU (or other) working papers.

<b>Task</b>	<b>Time Allocation (Months)</b>
Cross-checking and verification of education data sets and relevant survey data sets	5
Descriptive overview of school, person and household effects *	3
Educational production function analysis *	4
Preparation of distributional equity data bases	3
Empirical overview of distributional equity in schooling system *	3
Inequality analysis of distributional equity *	3
Programme evaluation of schooling system and overall policy prognosis *	3
<b>Total Months</b>	<b>24</b>

\*: Denotes that this task will directly yield published outputs.

It is clear from the above that much time will have to spent on accessing and preparing the disparate sets of education databases. We suspect that this may be one possibly frustrating aspect of the project, as these databases would need to accessed through the national DoE, and may require much manipulation before proper statistical analysis can proceed. It is clear though, from the envisaged workplan, that at least six published outputs, initially in the form of DPRU working papers, will be completed during the course of the project.

## Proposed Research Team

It is proposed that project team be composed of:

- Dr. Haroon Borat, Director, DPRU
- Mr. Paul Lundall, Deputy Director, DPRU
- Ms. Azola Majeke, Researcher, DPRU
- Statistical Consultant: to be appointed

CVs of the 3 identified members of the team are attached in a separate document.

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