Executive Summary

Our goal was to see if a relationship could be established between measures of states’ fulfillment of their obligations to ensure the right to education, and measures of its enjoyment. We tried to determine if there is any correlation between these measures, for which data was available. In short, we were trying to quantitatively establish the strength of the relationship between the two aspects (obligation and enjoyment) of assessing socio-economic rights.

For the 3131 countries we analyzed, no strong correlation could be clearly defined between the governmental per student primary education expenditures as percent of per capita GNP and the primary school net enrolment ratios. In-depth analysis of related factors confirmed that no conclusive relationships exist. All that we can say with certainty is that the presently available data on these two indicators alone are not sufficient to determine whether a relationship exists between the state’s fulfillment of their obligations (as measured by percentage expenditures) and the extent to which the right to education is enjoyed (as measured by net enrolment ratio).

Our finding is very much dependent on the quality and availability of data from the sources we used. In particular, data are not available for every year for every country for every category of indicator. Also, the data that are available have characteristics that make us regard them to be of dubious validity.
Definition of the project

Our team, under the Project for Economic, Social and Cultural Rights, working with Human Development Report staff of the United Nations Development Programme (UNDP), aimed at examining the relationship between the enjoyment of the right to education, and the financing aspects of the state obligations to respect, protect and fulfill the right under the International Covenant on Economic, Social and Cultural rights. We tried to identify any correlations that may exist, i.e., whether the extent to which the state fulfills its obligation by allocating resources determines the extent to which the right to education is enjoyed by the population. Put another way, how strong is the relationship between the public spending and the level of realization of the right? Useful findings, if any, would facilitate the assessment of state obligations by the UN Committee on Economic, Social and Cultural Rights.

Following the suggestions made by the client, we drew data from United Nations sources for 51 countries. The client envisioned three phases for this analysis (time-permitting):

Phase 1: Data analysis on 31 countries focusing on the correlation between government expenditure on primary education per student as percent of GNP per capita (hereafter referred to as ‘PE expenditure’), and the primary school net enrolment ratios as a possible indicator of its outcome. After a regression analysis of this data, if a correlation was apparent, we would begin phase two.

Phase 2: Data analysis would focus on the correlation between GNP, public expenditure ratio to the GNP, public spending on education ratio to total public expenditures, primary education spending ratio to total education expenditure; and its outcome (primary school net enrolment ratios).

Phase 3: If a relationship had been established in Phase 1, further data analysis would seek to find if a similar relationship existed at a different level of development as well, analyzing a new set of approximately 30 countries with higher GDPs. Time-permitting, we might also have done deeper analysis of each data set, analyzing other related variables for further understanding (enrolment ratios broken down by level of education, youth and adult literacy rates, etc.).
### Indicators Considered

<table>
<thead>
<tr>
<th>Indicator considered</th>
<th>Source</th>
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<tr>
<td>Government expenditure on primary school per student as percent of GNP per capita</td>
<td>World Bank World Development Indicators 2000</td>
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<td>Expenditure on education as percent of total government expenditures 1997</td>
<td>UN Statistical Yearbook 1997³</td>
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<td>Primary school net enrolment ratio 1990-1997</td>
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### Methodology

1. **Selection of Countries (Elements Considered)**

The client stated a preference for approximately 30 countries whose GDPs per capita (purchasing power parity in $US) in 1998 were as similar as possible. These countries were to fall into the medium and low human development range according to the Human Development Report 2000 (hereafter abbreviated as HDR2000). We made a chart and table of all countries ranked by 1998 GDP per capita (PPP $US) as listed in the HDR2000 to assist in the country selection decision. (see Graph 1, Graph 1a, and Data Set 1).

Although it was likely that choosing countries with a GDP per capita of over $2000 might have more reliable data collection abilities than countries with lower GDPs, this would mean all the countries would fall into the HDR2000’s “medium human development” level, so we suggested choosing countries with GDP per capita over $1500 to capture some of the “low human development” countries. This would mean beginning the range with Bhutan, with a GDP of $1536 and ending with Ecuador, with a GDP of $3,003, so the range between them is $1467. In the end, 51 countries were chosen for Phase 1 analysis, beginning with Bhutan and ending with

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⁴ Website of UNESCO’s World Institute for Statistics: see http://unescostat.unesco.org/en/stats/stats0.htm, World Education ‘Indicators,’ Participation in Education, Gross and Net Enrolment Ratios by Sex (Primary), select Region and Year.
Peru (GDP of $4282) because we found that 34 countries do not have data listed for both indicators of primary school net enrolment ratio and government PE expenditure. (see Data Set 2)

To analyze whether a correlation exists between our two indicators, we removed all countries with insufficient data from the list (i.e., missing data for one or both variables) so that we could compare 1997 primary school net enrolment ratios to PE expenditure. This left us with a set of 17 countries (see Graph 2 and Data Set 3) for which we created a scatterplot, but felt we needed more countries to be more conclusive.

Our next step was to add more countries to our list that had data available, giving us 31 countries. (see Data Set 4)

2. Relationship between PE expenditure and Primary School Net Enrolment Ratio

A regression analysis of the graph of these two variables follows. (see Graph 3)

The simple linear regression is drawn as shown in the scatterplot with slope of 0.4257 and the intercept of 80.759. However, the value of R-Square is 0.0382. In other words, less than 4 percent of the variability is explained by the linear regression. There is hardly any correlation between the two variables.

Further observations can be made from the scatterplot:

(1) A group of countries up near 100% in the primary school net enrolment ratio -- Ecuador, China, Philippines, Cuba, Tunisia, Romania, and Turkey -- does not present much commonality in terms of geography or PE expenditure, except that half of the six countries belong to the defunct "socialist camp." The PE expenditure ranges from 6.6% (China) to 20.1% (Romania).

(2) Neither did we find negligible commonality among the 13 countries showing more than 90% primary school net enrolment ratio. The PE expenditure for these countries ranges from 3.3% (Dominican Republic) to 30.8% (Bulgaria).

(3) The countries with lower primary school net enrolment ratios -- Guinea, Côte d'Ivore, Mauritania, and Lesotho -- have commonalities. Their GDP per capita (PPP US$ in 1998) is the lowest (below PPP $2,000) among the 31 observations, and all of them are in Sub-Saharan Africa. The PE expenditure ranges from 7.9% (Guinea) to 16.9% (Côte d'Ivore).

(4) A high primary school net enrolment ratio is found in countries with a low PE expenditure.

The result of this exercise suggests:

(1) The data themselves are not highly reliable. We remind the reader that the sources of these data are the governments, they are not subject to critical review before publication, and the definitions of school are bound to be different.
(2) Other factors such as government policies, law, culture, drop-outs, gender, and rural-urban disparity have to be taken into account in further quantitative analysis of the level of the realization of the right to education.

3. Relationship between GDP and Primary School Net Enrolment Ratio

Following the above exercise, for the same 31 countries, we plotted a regression line comparing GDP per capita (PPP $US) as the independent variable and primary school net enrolment ratio as the dependent variable in order to glean any further insight this might provide in our analysis. (see Graph 4).

We think that even with its limitations, this graph allows us to draw conclusions that help us to understand the relationship. If we draw a vertical line where GDP per capita is at 3000 PPP US$ per capita, the countries below this threshold show a clear pattern. With the exception of an outlier (Guinea), all other countries show a clear correlation between increase in GDP and increase in enrolment ratios. Guinea is an interesting exception, as its enrolment rates are extremely low even when we compare it to poorer countries. There does not seem to be a satisfactory explanation for this anomaly in the data we examined.

Above 3000 PPP US$ per capita, however, the correlation is not at all clear. Actually, some countries manage very high enrolment ratios despite their low GDP (Philippines, Cuba), while others have higher GDP and low enrollment ratios (Morocco, Guatemala, Lebanon). Finally, countries like Thailand, Venezuela, Colombia and Costa Rica have relatively low enrolment ratios (between 82 and 92%), considering that all these countries' GDPs are among the highest in our sample.

Venezuela’s low rates could be a result of very low expenditure on primary education per student (2.1% of GNP per capita). But Thailand, Colombia and Costa Rica do not fare much better despite the fact that their expenditures are all above 10%.

Drawing a regression line in this graph and examining the equation of the line can tell us something more. The slope of the line is particularly relevant: it tells us that enrolment and GDP are positively correlated, but that the correlation (0.0056% for every dollar) is weak in general terms.

The only conclusion that we can make from this graph is that there might be some correlation between GDP and enrolment ratios when GDP is between 1500 and 3000 PPP USD per capita.

4. Time Series Analysis of 15 Countries

As the next step, we chose 15 of the countries we found peculiar in their outcome and further analyzed them by doing time series graphs of their net primary enrolment ratios and their total expenditure on education as a percentage of total government expenditures (see Data Set 5 and Graph Set 5).
We could not draw any conclusions from this series of graphs because the data are sparse and fragmentary. Such conclusions as we can draw are contradictory. For example, the Ivory Coast dramatically reduced expenditures on education from 1991 to 1996, but its enrolment ratio seems to increase steadily. One could say that, despite the reduction, expenses are still quite high in absolute terms (well over 20%). The same tendency (decreasing expenditure and increasing enrolment ratio) is observed in the cases of Lao PDR and Ecuador.

Venezuela, on the contrary, has seen an increase in expenditure and a subsequent decrease in enrolment ratio. Lebanon had declining expenditure and for two years in a row exactly the same (and quite low, 76.1%) enrolment ratio, China had stable expenditure and a decline followed by an increase in enrolment ratio. China reported a ratio over 100% for the year 1997: this is probably related to the inclusion in the statistics of students who are not in the primary age group, but are still enrolled in primary school.

In conclusion, these partial data seem to suggest that, if there is a relationship between the two variables, they are inversely related in most cases. However, we do not feel this is a valid conclusion and prefer to suggest that, with the data we have, we cannot establish any correlation between the two variables. Throughout this analysis it seems clear that states’ expenditure is not a measure of the fulfillment of the states’ obligation.

**Conclusion**

We conclude that for the countries analyzed, with the data presently available, no strong correlation exists between government expenditure on primary education per student as percent of GNP per capita (referred to as ‘PE expenditure’ above) and primary school net enrolment ratios. Neither has a conclusive relationship been found between GDP per capita (PPP US$) and primary school net enrolment ratios.

The only thing we can say with certainty is that these two indicators are not sufficient to determine whether a relationship exists between the extent to which the state allocate financial resources and the extent to which the right to education is enjoyed. The absence of the correlation between the two sets of variables, however, may be interpreted as a strong indication that public expenditure alone – however it may look to someone as a fulfillment of obligation – does not determine the level of the enjoyment of the right. Given the diverse relationship between the PE expenditure and primary school net enrolment ratios demonstrated by the countries analyzed, other factors of possible relevance need to be examined, including legal, cultural and social factors within each country.

Our work was considerably handicapped by the lack of data of high quality. We believe that further studies in this – and possibly similar areas – must be able to rely on the data. Attention to the quality of the data is critical to the use of indicators to monitor the fulfillment of state obligations and the enjoyment of rights. One recommendation would be to redo a similar analysis with the next year’s data once it becomes available, under the hopeful assumption that data collection and reporting by each country improves as each year goes by.
Lessons Learned

1. A concrete and realistic plan needs be set up at the initial stage of the project.

We tend to be ambitious, get excited about the idea of expected research findings, and underestimate the anticipated difficulties at the initial state of the project. In writing up a project proposal, we listed the potentially useful sources of data and indicators instead of being precise in terms of the availability of specific variables.

2. Once you start working with data, you inevitably face unexpected difficulties.

More time, energy and patience is required and the progress you can actually make is less than anticipated. Time schedule of the project may scarcely be met.

3. International compilation of quantitative data is not as reliable or consistent as one would expect. The UN agencies rely primarily on the member states in collecting and reporting the data. Data does not appear to be screened, and some of the data is susceptible to a reasonable doubt. Quite a lot of data is missing.

4. It is dangerous and perhaps not appropriate to draw a conclusion from a data analysis which uses only a small number of variables, particularly in case of an issue that a range of factors appear to have impact on. It is desirable if many variables are available and used in the analysis, within the given time and under other types of constraints.
Charts follow:

GRAPH 1
This almost tells the story
Graph 2

Relationship between education expenditure and enrolment rates

Expenditures on primary education/student as % of GNP per capita (1997)

Primary school age group enrolment ratio (%) (1997)
Relationship between education expenditure and enrolment ratios

$y = 0.4257x + 80.759$

$R^2 = 0.0382$

Expenditure on primary education/student as % of GNP per Capita (1997)

Primary School age group enrolment ratio (%) (1997)
Graph 4

The graph illustrates the relationship between GDP per capita (PPP USD 1998) and primary school age group enrolment ratio (% 1997) for various countries. The data points for each country are plotted on the graph, with the country names labeled near their respective points. The line of best fit is represented by the equation:

\[ y = 0.0056x + 64.543 \]

with an R² value of 0.38.