Chalk versus Bits on a Land of Disparities

Wendy Rodriguez

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Working Paper. Written by Wendy Rodríguez, INCAE Researcher. This work seeks to stimulate thought about: new conceptual frameworks; possible alternatives to framing problems; suggestions to implement public policies; regional, national, and sectorial investment projects; and business strategies. It does not intend to prescribe models or policies. Neither does it make the authors or INCAE responsible for incorrect interpretation of its content, nor for good or bad management or public policy practice. The objective is to elevate the level of discussion regarding competitiveness and sustainable development in the Central American region. Under the prior stated conditions, INCAE, and not necessarily its contributing partners, is responsible for its content. May 2004.
# TABLE OF CONTENTS

**INTRODUCTION** ........................................................................................................................................5

1.1 **EDUCATION BALANCE OF GUATEMALA** .........................................................................................6
1.2 **EDUCATION BALANCE OF EL SALVADOR** ......................................................................................7
1.3 **EDUCATION BALANCE OF HONDURAS** ..........................................................................................8
1.4 **EDUCATION BALANCE OF NICARAGUA** .........................................................................................10
1.5 **EDUCATION BALANCE OF COSTA RICA** .......................................................................................11
1.6 **TOTAL BALANCE** ..........................................................................................................................13

2. **DISPARITIES, THE PROBLEM OF EQUITY IN CENTRAL AMERICA EDUCATION** .................17

3. **PLUS: THE NEW CHALLENGES OF THE 21ST CENTURY** ...............................................................19

4. **IS THERE A VIABLE SOLUTION TO PAY UP OUR DEBTS - OLD AND NEW?** ..................23

5. **BIBLIOGRAPHY** ................................................................................................................................25
INTRODUCTION

Central America is a land of high contrasts. The isthmus area is barely 201,403 sq mi., and harbors seven different nations. After decades of civil war and political instability, peace and democracy are back, but the challenge of extreme poverty has not been solved.

As the region looks forward to an agenda of sustainable development and competitiveness, education and technology are key words that must be part of an equation that fights poverty, fosters productivity, and enhances the quality of life. However, in education, we still have an enormous debt from the past. There are new needs that the 21st century is adding to this debt in each and every country of Central America. The purpose of this study is to show the requirements of the people of Central America to make these countries competitive over the evolving century.
1.1 Education Balance of Guatemala

Guatemala, with more than 26,000 sq mi. and 12 million inhabitants in the year 2002, has passed through many different plans and reforms in the educational field since the Central America independence from the Spanish Crown in the XIX century.

With Mariano Gálvez at the head of a liberal government in the first years of independence (1831), a big effort was made to dramatically change not only the educational system, but also the bottom line of a society trying to eliminate colonial inheritance and church control. Guatemala started as a republic searching for an educational system to solve the needs of society.

Almost two hundred years have passed, and the long-term goals of the educational system are along the same line as during the time of Gálvez. He wanted to extend primary education in every little town and provide at least one school for every five hundred citizens. Contemporary topics concern making primary education universal. He created the first school to prepare teachers with initiative to adapt new educational plans in order to satisfy the requirements of every student. In these days, topics like educational decentralization, permanency of the teaching staff and acknowledging teacher’s merits, have been part of every educational plan during Guatemala’s history.

The incorporation of women and the indigenous people into civilization by making them part of educational programs, has been getting more importance in the education agenda of the last decade. However, up until 1998, 60% of the indigenous population had no education at all, and less than 40% had studied primary school\(^1\).

Currently the national budget for education measured at the end of 2001 represented 1.7% of the GNP and 15.8% of the national budget. From the total budget, 63% was expended in primary school. The literacy rate rose to 68.1% of the adult population, and 78.9% of minors. The total rate of enrolment in primary school went up to 72%, accounting for a drop out rate of 50% in 5\(^{th}\) grade. Inequality in income measured by the gap between the 10% richest to 10% poorest was 29.1%, which represents that the poorest 20% only get 3.8% of the total income of the society.\(^2\) Table 1 presents a brief evolution of Guatemalan education indicators for the last two decades.

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### Table 1

**PRINCIPAL EDUCATION INDICATORS IN GUATEMALA**

<table>
<thead>
<tr>
<th>Year</th>
<th>Population aged 15 years and over Illiteracy rate %</th>
<th>Population aged 15 to 24 years Illiteracy rate %</th>
<th>Primary education Pupil/teacher ratio %</th>
<th>Gross Enrolment ratios %</th>
<th>Percentage of cohort reaching Grade 5 Final Grade</th>
<th>Total expenditure on education %</th>
<th>% total government expenditure</th>
</tr>
</thead>
<tbody>
<tr>
<td>1980</td>
<td>46.2</td>
<td>34.4</td>
<td>34</td>
<td>21</td>
<td>71</td>
<td>19</td>
<td>8</td>
</tr>
<tr>
<td>1985</td>
<td>42.3</td>
<td>30.3</td>
<td>37</td>
<td>27</td>
<td>78</td>
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<td>1990</td>
<td>38.5</td>
<td>26.6</td>
<td>n.i.</td>
<td>n.i.</td>
<td>78</td>
<td>n.i.</td>
<td>n.i.</td>
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<tr>
<td>1995</td>
<td>34.7</td>
<td>23.7</td>
<td>34</td>
<td>34</td>
<td>87</td>
<td>26</td>
<td>8</td>
</tr>
<tr>
<td>2000</td>
<td>31.9</td>
<td>21.1</td>
<td>35</td>
<td>35</td>
<td>88</td>
<td>26</td>
<td>n.i.</td>
</tr>
<tr>
<td>2001</td>
<td>n.i.</td>
<td>n.i.</td>
<td>33</td>
<td>51</td>
<td>102</td>
<td>37</td>
<td>n.i.</td>
</tr>
</tbody>
</table>


The incorporation of indigenous people into society, the increase in the literacy rate, the reduction of the dropout rate, the permanent training of the teaching force, and the incorporation of new technologies to the classroom are the principal components of the current agenda of the Guatemalan Government. In Guatemala, information technology has not yet had any presence in public education. There are still some educational abilities the governments should take care of in this century in order to turn Guatemala into a more competitive country: fight poverty, foster productivity, and enhance quality of life.

### 1.2 Education Balance of El Salvador

El Salvador, the smallest country in Central America, with an approximate area of 8,000 sq. mi., and more than 5 million inhabitants, has been one of the most successful Central American countries in terms of stability, labor force productivity, technical advance, and education.

Ever since the liberation from the Crown domain, El Salvador, through its governments, has kept looking forward to improve the quality of education after realizing that in order to be competitive, it was necessary to have a useful society with useful men at home, community, and the country as a whole. During the 1940’s reform, the objective was to bring in a new integrative pedagogy used by advanced countries that worked with the idea of correlations between the different levels of education. This model gave continuity to education during the life of the individual.

Additionally, during the last decade, El Salvador promoted administrative decentralization of education where all the power that was concentrated in the upper level of the administrative pyramid was delegated to the lower part. That posed a problem of an unbalance between administrative and teaching staff. At the same time, they were trying to introduce a technical-pedagogic concept in education, but with a total concern on decentralization, the technical concept did not have relevance.
Nowadays, adult and minors literacy rates are 78.3% and 88%, respectively. There is 78% enrolment in primary school and 22% in secondary school, considering a dropout rate in 5th grade of 33%. The national educational budget has been classified as a percentage of the GNP and as a percentage of the national budget is 2.5% and 16% respectively. In terms of inequality in the incomes, the poorest 20% get 3.7% of the total income of the country. Table 2 presents a brief evolution of Salvadorian education indicators for the last two decades.

### Table 2

**Principal Education Indicators in El Salvador**

<table>
<thead>
<tr>
<th>Year</th>
<th>Population Aged 15 Years and over</th>
<th>Population aged 15 to 24 years</th>
<th>Primary education Pupil/teacher</th>
<th>Gross Enrolment ratios</th>
<th>Percentage of cohort reaching</th>
<th>Total expenditure on education</th>
<th>% total government expenditure</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Rate %</td>
<td>I Illiteracy rate %</td>
<td>ratio</td>
<td>% Pre Primary</td>
<td>% Primary</td>
<td>% Secondary</td>
<td>% Tertiary</td>
</tr>
<tr>
<td>1980</td>
<td>33.8</td>
<td>21.5</td>
<td>48</td>
<td>11</td>
<td>75</td>
<td>24</td>
<td>9</td>
</tr>
<tr>
<td>1985</td>
<td>30.7</td>
<td>18.7</td>
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<td>n.i.</td>
<td>n.i.</td>
<td>n.i.</td>
<td>17</td>
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<tr>
<td>1990</td>
<td>27.4</td>
<td>16.2</td>
<td>n.i.</td>
<td>n.i.</td>
<td>81</td>
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<td>16</td>
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<tr>
<td>1995</td>
<td>24.0</td>
<td>14.0</td>
<td>28</td>
<td>31</td>
<td>88</td>
<td>34</td>
<td>19</td>
</tr>
<tr>
<td>2000</td>
<td>21.3</td>
<td>12.0</td>
<td>33</td>
<td>40</td>
<td>97</td>
<td>37</td>
<td>n.i.</td>
</tr>
<tr>
<td>2001</td>
<td>n.i.</td>
<td>n.i.</td>
<td>26</td>
<td>44</td>
<td>109</td>
<td>54</td>
<td>18</td>
</tr>
</tbody>
</table>


There are still many liabilities left in the educational programs planned by the Salvadorian government that has to be fulfilled in this new century. The technological part of education was left aside in order to solve major administrative problems. The story of a typical Central American country is repeating no technological advance in public education and not enough financial resources to do it in a sustainable way. Many plans sound very good but there are too few tools to reach them.

Even though El Salvador is in better shape to face the new century with better equity conditions than Guatemala, with some programs on science and technology in order to stimulate imagination and creativity in children, and help in the individual sensitivity and artistic development, there is a liability the country has to pay so that it can achieve the goal of fostering productivity and enhancing quality of life.

**1.3 Education Balance of Honduras**

Honduras the second largest country in Central America, with almost 43,300 sq. mi. and a population of 6 million inhabitants, have had one of the poorest economies in Latin America, which have caused multiple disparities on their education system.
During the colonial period, education in Honduras was limited to a few primary schools established by the Roman Catholic Church. Private tutors were employed by the wealthy to teach their children. Most young people went to Guatemala or Nicaragua to obtain university degrees. In 1847 the Literary Academy of Tegucigalpa created by a group of young Hondurans led by Father José Reyes, was raised to the status of National University of Honduras.

Although a formal public school system has been in existence since 1882 and although primary education is compulsory and public education is free, there is general indifference to education. While the educational structure has not many differences from the other Central American countries, the social foundations of education are much more fragile in Honduras. Poverty is more acute, social divisions sharper, and the economy more rural. A series of educational reforms, particularly those following the report of the National Commission for Educational Reform in 1973, have tried to correct the weakness in the system, but not all sectors of education have benefited equally from these reforms.

Currently adult and minors literacy rates are 74% and 82.9%, respectively. There is 72% enrolment in primary school, considering a dropout rate in 5th grade of 50%. The national educational budget has been classified as a percentage of the GNP and as a percentage of the national budget is 3.6% and 16.5% respectively. In terms of inequality in the incomes, the poorest 20% get 1.6% of the total income of the country. Table 3 presents a brief evolution of Honduran education indicators for the last two decades.

<table>
<thead>
<tr>
<th>Year</th>
<th>Population aged 15 years and over</th>
<th>Population aged 15 to 24 years</th>
<th>Primary education</th>
<th>Gross Enrolment ratios</th>
<th>Percentage of cohort reaching</th>
<th>Total expenditure on education</th>
<th>% total government expenditure</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Illiteracy rate %</td>
<td>Illiteracy rate %</td>
<td>Pre Primary %</td>
<td>Primary %</td>
<td>Secondary %</td>
<td>Tertiary %</td>
<td>Grade 5 Final Grade</td>
</tr>
<tr>
<td>1980</td>
<td>39.0</td>
<td>29.0</td>
<td>37</td>
<td>9</td>
<td>98</td>
<td>30</td>
<td>7</td>
</tr>
<tr>
<td>1985</td>
<td>35.9</td>
<td>26.8</td>
<td>n.i.</td>
<td>12</td>
<td>108</td>
<td>37</td>
<td>9</td>
</tr>
<tr>
<td>1990</td>
<td>33.0</td>
<td>24.6</td>
<td>38</td>
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<td>n.i.</td>
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<tr>
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<td>30.3</td>
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<td>111</td>
<td>n.i.</td>
<td>10</td>
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<tr>
<td>2000</td>
<td>27.8</td>
<td>20.3</td>
<td>n.i.</td>
<td>n.i.</td>
<td>n.i.</td>
<td>n.i.</td>
<td>n.i.</td>
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<tr>
<td>2001</td>
<td>n.i.</td>
<td>n.i.</td>
<td>34</td>
<td>21</td>
<td>106</td>
<td>n.i.</td>
<td>15</td>
</tr>
</tbody>
</table>


Honduran education shares many of the characteristic features of the Latin American systems, such as the rural urban unbalance; the teachers shortage; the poor quality of textbooks and teacher’s materials; part-time professors at the university level; low funding, specially for secondary school; and the prevalence of traditional modes of learning. Apathy toward education on the part of the vast majority of the population has blunted the urgency of educational reforms and innovations.
1.4 Education Balance of Nicaragua

Nicaragua is the largest country in Central America with almost 50,000 sq. mi. of land and sea area, and 4.5 million people. The civil wars and the sandinist rule caused a devastating effect on the quality of the life of Nicaraguans. Educational systems could not avoid this situation.

After independence from the Spanish Crown, French's and German's liberal traditions gained ascendancy in the Nicaraguan culture. Both, secondary and higher education continued to cater only to the upper strata of the society. The first institution of higher education in Nicaragua was the Seminario Conciliar de San Ramón, founded in the city of León in 1670 following the Council of Trend. By a royal decree in 1812, the seminary was upgraded into the University of León. It was rendered in 1958 and renamed the National Autonomous University of Nicaragua (UNAN) in 1966.

Education was a symbol of status and until 1979 the Education Ministry was the only institution commissioned for establishing curricula, lay down admission requirements, and taking care of every aspect of national education. After this year The New Nicaraguan Education begins the rupture of this framework while it incorporated the voice of an organized society for defining and executing the educational policy. During 1981, almost 50 thousand people belonging to 30 different organizations representatives of all sectors joined on a crusade to constitute the Educational Philosophy of Revolution.

The economic crisis caused by the war of 1982 that generated an inflation rate of 33,000% between 1987 and 1988 obligated the Sandinist Government to reduce the size of the state (government institutions and public enterprises), causing a negative effect on the educational system. This effect could not be reversed until 1993 when the Aims, Objective, and Principles of the New Education were made of public acquaintance. This was a continuation of the Educational Philosophy of Revolution.

According to the UNDP 2001 Development Report, adult and minors literacy rates are 68.2% and 73.4%, respectively. There is 77% enrolment in primary school and 33% in secondary school, considering a dropout rate in 5th grade of 51%. The national educational budget has been classified as a percentage of the GNP and as a percentage of the national budget is 3.9% and 8.8% respectively. In terms of inequality in the incomes, the poorest 20% get 2.3% of the total income of the country. Table 4 presents a brief evolution of Nicaraguan education indicators for the last two decades.
### Table 4

**Principal Education Indicators in Nicaragua**

<table>
<thead>
<tr>
<th>Year</th>
<th>Population aged 15 years and over</th>
<th>Population aged 15 to 24 years</th>
<th>Primary education</th>
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</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Illiteracy rate %</td>
<td>Illiteracy rate %</td>
<td>% Pre Primary</td>
<td>% Primary</td>
<td>% Secondary</td>
<td>% Tertiary</td>
</tr>
<tr>
<td>1980</td>
<td>41.8</td>
<td>37.0</td>
<td>35</td>
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<td>94</td>
<td>41</td>
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<tr>
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<td>97</td>
<td>32</td>
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<tr>
<td>1990</td>
<td>38.7</td>
<td>34.4</td>
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<td>94</td>
<td>40</td>
</tr>
<tr>
<td>1995</td>
<td>37.2</td>
<td>33.0</td>
<td>38</td>
<td>19</td>
<td>103</td>
<td>49</td>
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<tr>
<td>2000</td>
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<td>31.7</td>
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<td>24</td>
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</tr>
<tr>
<td>2001</td>
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<td>n.i.</td>
<td>36</td>
<td>27</td>
<td>104</td>
<td>54</td>
</tr>
</tbody>
</table>


### 1.5 Education Balance of Costa Rica

Costa Rica, a country with more than 3.2 million inhabitants and almost 19,700 sq. mi. of surface, has acted particularly different from the other Central American countries since the Colonial Era. It has faced different conditions and has always been open to opportunities. As a result, Costa Rica has reached an undeniable success in the last decade.

Costa Rica, since its beginning as a Province of the Spanish Crown, always had a special interest in education, and realized that the public authority held by the government had the moral responsibility to provide a free education to every person living in the national territory. The problem of the time was resources, because as a province, there were not too many financial resources coming from the Crown. They found different alternatives to finance education. Among them there were special taxes, and sales of free land. However, the problem could not be diminished. These years were the bases to a free, broad, and equitable education that every Costa Rican was looking for.

During the 20th Century, the government tried to create a flexible educational system, where the student was the core part of the model, in order to accompany the country’s development process. They realized in order to make an effective change in education; it was necessary to treat the educational body as a whole, where all the structures (kindergarten, primary or elementary school, secondary or high school, and university) were related to each other. All this caused a growing aspiration of the people to have a better life, with technical and scientific development as new orientations for the education.

In the last two decades, the society’s effort on education was reduced and then capitalize. The government did not establish any mechanisms to financially support their commitment with pre-school, primary and, secondary school. The government only
created a university fund called FEES, so that universities could use it exclusively to renew scientific and technological equipment.

In 1995, the government took new measures to enhance education. The Education Ministry designed the EDU–2005 Project that incorporated classes such as computer science, a second language, incentives, teacher training, a long lasting educational period, and infrastructure and educational equipment strength. In 1998 a Program called “Computers in Education” tried to increase the education quality in both, primary and secondary school.

Nowadays, Costa Rica has the best indicators in education of the region and is considered by the UNDP among the countries of high development. The national educational budget measured at the end of the year 2001 represented 5.4% of the GNP and 22.8% of the national budget. From the total budget, 40.2% was expended in primary school. The literacy rate rose to 95.5% of the adult population, and 98.3% of the minors. The total rate of enrolment in primary school went up to 89%, with a dropout rate of 10% in 5th grade. Inequality in income measured by the gap between the 10% richest to 10% poorest was 20.7, which represents that the poorest 20% only get 4.5% of the total income of the society. Table 5 presents a brief evolution of Costa Rican education indicators for the last two decades.

Even though Costa Rica has fostered productivity and enhanced quality of life for a certain part of the population, they have to worry about the new challenges that the 21st century will bring to maintain the efforts and consistency of the last two.

Table 5

<table>
<thead>
<tr>
<th>Year</th>
<th>Population aged 15 years and over</th>
<th>Population aged 15 to 24 years</th>
<th>Primary education</th>
<th>Gross Enrolment ratios</th>
<th>Percentage of cohort reaching</th>
<th>Total expenditure on education</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Illiteracy rate %</td>
<td>Illiteracy rate %</td>
<td>Pupil/teacher ratio</td>
<td>Pre Primary %</td>
<td>Primary %</td>
<td>Secondary %</td>
</tr>
<tr>
<td>1980</td>
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<td>1985</td>
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<td>52</td>
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<td>40</td>
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<td>25</td>
<td>87</td>
<td>107</td>
<td>60</td>
</tr>
</tbody>
</table>

1.6 Total Balance

The current educational system in Central American countries undoubtedly has proved to be much better than those used in past decades. It has increased administrative decentralization and many valued lessons have been taught about the equilibrium between central administration and schools. There have been programs to improve quality and equity in education, teaching at basic and middle levels, and the findings of a relative consensus of what works or not in terms of reforms. Table 6 shows the current conditions of the educational reforms in every country of Central America.

### Table 6

**Principal indicators of the current conditions of the educational reforms**

<table>
<thead>
<tr>
<th></th>
<th>Guatemala</th>
<th>El Salvador</th>
<th>Honduras</th>
<th>Nicaragua</th>
<th>Costa Rica</th>
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<td>Schools administrated by parents</td>
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<td>Resources transfer to schools</td>
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<td>3</td>
<td>3</td>
<td>3</td>
<td>2</td>
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0 = Not defined  1 = Planned  2 = Initial performance  3 = Advanced performance

Source: PREAL "Mañana es muy Tarde", Information obtained through interviews to Education Ministry personnel and educational specialists in the countries.
And the Graphics bellow, show the illiteracy rates, illiteracy population, and the total population to give a more realistic sense of the growing problem.

**FIGURE 1**

**ILLITERACY RATE**


**FIGURE 2**

**ILLITERACY POPULATION**

In spite of the effort, the expected results have not yet been accomplished. The initiated changes are not completed, even though education as a topic has become a priority in the public agenda, and education deterioration in the region has almost been stopped. Not even equity, quality nor efficiency of education have been achieved in the proportion that was desired because of factors related to the general conditions of the economy. Disparities among distributions of educational opportunities between different social groups persist and the yield of the educational system in the region is still far bellow of the education yield for developed countries.

2. DISPARITIES, THE PROBLEM OF EQUITY IN CENTRAL AMERICA EDUCATION

…But, “education by itself is not enough.”

According to Marcela Gajardo, in her work on educative reforms in the 1990’s, although in one hand education can help to reduce poverty, make nations competitive, make people productive, and build solid and stable democracies, on the other hand the social environment, the climate at home and cultural heritage are the key success factors strongly related to the social class position of the previous generation. That is how, because of the conditions inherited by previous generations, equity in the access to education and the student permanency rate in schools, besides the youth opportunities to reach welfare, could not be improved.

According to IDB on average 33% of the adult population in Latin American countries lack of any type of education. 76% of Guatemalan poor children finish the first year of primary school. It is important to remember that the indigenous population represents 23% of the total population in Central America, and most of them are Guatemalan, where the indigenous people have to face barriers to education access. Figure 4 presents the education distribution according to ethnic origin.

![Figure 4](image)

**FIGURE 4**

**EDUCATION DISTRIBUTION IN GUATEMALA ACCORDING TO ETHNIC ORIGINS 1989**

When the children belong to the middle and upper strata of society, these percentages grow up to 92% and 96% respectively. But, in the 5th grade of school only 32% remains of Central American children who belong to the lower strata of society, in contrast with 83% of the upper strata, and 49% of these children make it through 9th grade. This bad distribution of education in Central America, that is represented in Figure 5, in general

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3 Marcela Gajardo, PREAL No. 15 (Partnership for Educational Revitalization in the Americas), Educativa Reforms in Latin America, Balance of a Decade. September, 1999

4 Inter-American Development Bank, 1998
terms, cannot be ascribed to access of the poor to the educational systems, but to the growing rates of repetition and dropout of the poor. This is how educational system in highly stratified places works: no impact on the social movement between classes and no lowering of the gap in income.

**FIGURE 5**

**SCHOOL LIFE EXPECTANCY AVERAGE FOR POPULATION AGED 25 YEARS ACCORDING TO POVERTY CONDITIONS**

![Graph showing school life expectancy average for population aged 25 years according to poverty conditions](image)


*Based on a survey made to homes between 1994 - 1996*

Even though it has been demonstrated that education can have a direct impact over income and productivity of labor force, it is also true that every advance obtained in these areas depends largely on the capacity of the economy to generate productive employment, and maintain sustainable economic growth. These two factors might be an effect of the educational system applied in the country, but they are also determined by economic and political factors. It is then responsibility of the educational systems to grant equity in access to knowledge and to provide high quality education that can compensate the disparities of income presented in the different strata of society.

Therefore it is imperative for a government committed to reduce and alleviate poverty to create a policy or any other measure that can achieve that commitment. If there is no parallel collaboration of the government, all the effort made to enhance quality, administration and efficiency of the educational system will be wasted.

The equity topic has to be addressed in order to avoid false expectations and to explain unsatisfied results in the reform process. It is also necessary to be acquainted with these equity problems to face in a more realistic way the challenges of the new century.
3. PLUS: THE NEW CHALLENGES OF THE 21ST CENTURY

There have been important efforts during the last decade to improve education in Central America. Even though the countries of the region have accepted education can be a door to development, and the governments have made significant efforts to modernize the educational systems, few of them have the conditions to adapt to the new challenges that a more globally connected world in the 21st century demands. This is a technological revolution that requires rapid changes in educational systems and students, and new competencies and accelerated growth for a labor force that current educational systems cannot provide.

Many countries are working on research and development to create more coherent scientific and technological policies, and to determine the challenges of the future, looking for integration between these policies and the economic and social needs.

One of the biggest challenges of the future is to try different alternatives that permit an efficient and equitable use of available resources in order to obtain better results. This is where digital education concepts can be introduced. With a rapid development of information and communication technologies (ICTs), giving basic tools of computer science to the children, have become priority to nations. In Central America, the major concern is the lack of resources, both human and financial, to ensure that schools get proper equipment and that teaching will be effective. Moreover, ICTs can also bring new opportunities to enhance quality in education at the lowest cost, and in countries like these in Central America the imaginative initiatives to disseminate new technology among the educational institutions in a cost effective way are growing.

When I talk about digital divide, I am referring to disparities created in the strata of society after the Industrial Revolution, where the world was divided into two very large blocks, the ones who have access to information technologies (high income societies) and the ones who have not (low income societies). The digital divide can exist not only between nations, but also within individual countries. Besides income and education, variables that influence the divide include geographical location, race and ethnicity. For instance, between 1997-1998, the digital divide between individuals at the highest and lowest education levels increased 25% and between those at the highest and lowest income levels increase 29%.

In this new information society, raw material and cheap labor can no longer sustain economies; indeed they have not sustained economies for more than a century as attested by the industrial divide. Knowledge, rather than labor, is the key element for sustainable development in this global economy.

The most serious divide is in the extent and quality of human knowledge and learning. It will be necessary to provide avenues to improving these fundamental needs.

According to Wadi D. Hadded, editor of TechKnowLogia5, countries have to meet the competitiveness challenge in terms of agility, networking and learning, and to arrange

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production to achieve quality, productivity, and flexibility. The good news is that, with the potential of human development and advanced technologies, developing countries can leapfrog. The bad news is that this process is not easy. On the contrary, unless conscious efforts are made, countries are likely to be marginalized. There is an educational emergency for:

- A workforce that has the foundation to enhance the quality and efficiency of product development, production and maintenance, and the flexibility to acquire the new skills required for new jobs; and

- A cadre of highly-trained, scientific, technological and processing personnel, including some with sophisticated research skills, who can fully understand developments in the material, scientific, technological, managerial and social areas and who can take the lead in their assessment, adaptation, and local applications.

In Central America there is little evidence of using technology to bridge the digital divide. But the main issue, like was explained before, it is not the so-called digital divide, but social, economic, and educational divides. These are not new, however digital technologies may help bridge these problems. It seems, in general terms, the use of technology in the region is only available to a privileged class that can afford it, pointing out again the equity problem.

There have been a few good practices acknowledged in Central America where technology has helped to bridge the social, economic and educational divides.

In Honduras, for example, pilot projects on solar energy conducted with the support of UNESCO and Consejo Hondureño de Ciencia Tecnología (COHCIT), were implanted in San Ramón and San Francisco, villages with no more than 900 people located in the hills above Choluteca. They are positive proof of the power of new technologies to leapfrog traditional barriers to development. Given their remoteness, the villages could neither maintain teachers for its schools (primary level only) nor benefit in a timely manner from a number of other public services. After the project’s inauguration in July 1999, the results have caught the attention of many, both within Honduras and beyond. A year later San Ramón has gone global, wired to the Internet through each of the 11 computers in its innovative classroom called Microworld. These changes, have given power to the people. On a scale of one to ten, villagers claim the quality of life has improved from zero to an eight. In this particular case, digital technology was used to ignite a true revolution in the way people learn and think. Technology was adjusted to the village needs. Technology increased the chances that teachers would actually show up for class and remain in the village for years to come. Teachers maintain they are impressed such activities sink in and facilitate the process of learning, and students show a big interest. The experience of San Ramón may have the most lasting effects serving as a catalyst for mobilizing communities around and in the name of the common good.

Costa Rica by the Computers in Secondary Education program is also another example of using technology as a digital bridge to diminish the social, economic and educational divides.

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divides. A loan agreement with the Central American Bank of Economic Integration provided funding to install computer laboratories in all secondary schools and in 50 percent of primary schools. The country had the basic infrastructure needed for computers in education program, and it incorporated what is considered the best practice in implementing an educational innovation: strong and continuing national commitment, good central management, emphasis on training, slow start-up on a pilot basis, good feedback mechanism, and focus on local participation and commitment. Teachers have been at the center of the Program To date, more than 15,000 teachers and school administrators have been trained. Continuous training and skills updating is the base of the program. The Costa Rican experience constitutes both a case about training teachers to use technology and using technology to train teachers involved in a technology program. In this case digital technology has been also used as a way to ignite a true revolution in the way people learn and think.

These two examples strengthen the fact that technology is only a tool. No technology can fix bad educational philosophy and practice. The challenge now is to rethink learning objectives and to align the learning technologies with these objectives. Education quality must be redefined and framed to include critical thinking, information management and sense making capabilities. The need in Central America and indeed every developing country, is for a different education, with success measured more by the ability of learners to think independently, exercise appropriate judgment and skepticism, and collaborate with others to make sense of their changing environment.
4. IS THERE A VIABLE SOLUTION TO PAY UP OUR DEBTS - OLD AND NEW?

Our line of credit is approaching its limit. We cannot keep increasing our accounts payable and not paying anything to them. It is time to think about a leapfrog that enables the region to reduce its poverty, and foster the competitiveness of our countries.

Information and communication technologies (ICT’s) have proved to be a cost-effective tool in order to find a solution to the accumulated educational debts raced through Central American history. ICT’s bridge the distance between remote communities and service providers such as markets, government departments, and aid agencies. The problem occurs when the opportunities to improve income generation and access provided by the new ICT’s is limited to the wealthy. This will perpetuate and strengthen the disparities already mentioned. This is when the governments have to design policies that ensure access for the poorest. These policies include privatization of the telecommunication network, fomenting competition, and providing a line up of the regulatory requirements so that private enterprises can work independently. Moreover, a massive commitment to improving the quality of education, training, and lifelong learning opportunities, accompanied by an increased focus on math, science, technology, business, and trade in educational systems, is essential for preparing people to work in IT fields.

The Internet has been one of the most exploited technological tools industrialized nations have used to strengthen their leadership in every aspect. Why can’t Central American countries get involved in this process? According to Mary Fontaine, due to a rapid advances in infrastructure options, developing countries need not progress through all of the same technological stages that other nations have but can jump right to the fiber, satellite, wireless, or broadband options that are now available. By participating in the global factory chain, entrepreneurs in developing countries can increase their access to global markets and reduce transactional costs. Such activities provide immediate opportunities for new business development, employment creation, and increased income generation. That is why Central American society needs to be prepared to leapfrog the barriers to become competitive.

Countries must find ways to educate their populations or miss the opportunity to become part of this modern world. With Internet access, countries that have no resources to build schools and train teachers, like Honduras and Nicaragua, may rent education hours from non-profit organizations dedicated to bring the highest level of education to any place in the world. That is the school of the future; a basic education provided through intelligent machines, able to understand questions, respond to students’ emotions, and do multiple tasks at one time. This system will make it possible for more students to be educated without the need for building more schools or hiring more personnel, the two largest expenses in education.

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Information Dissemination Specialist with LearnLink, a USAID-funded Global Communications and Learning System Project.
Except for the teacher-machine, technology already permits most of these proposals. Due to economies of scale, the proposals are cost-effective. With few students, one hires a teacher; with thousand of students, technology intensive alternatives may be less expensive. What is good for most of countries in Central America, for example Guatemala, is what is affordable for the masses, and compensates for the chronic scarcity of quality teachers. Claudio De Moura Castro in his book “Education in the Information Age”, referring to developing countries, he said that developing countries should concentrate on those technological alternatives that, at low costs, bring to the students the imagination and creativity of a few excellent teachers. While the use of computers in classrooms is not to be denigrated, a much greater potential can be found in distance education. This contrasts with the superlative and world-class performance of several mass education programs using radio, broadcast TV and video. Therefore, educational systems in Central America will have to change.

Governments have an important role in guiding their countries through the digital revolution, because physical access is not enough. It is equally important to ensure economic and social access by improving infrastructure and services, and investing in education. The digital revolution can either bring the world, including Central America to a new era of shared wealth bridging the digital divide, or it can further a wider divide. Partnerships between public and private organizations, research centers, universities and financial institutions are essential in accomplishing such an ambitious agenda.

With all this, it would be possible to use private investment and entrepreneurship to its full extent, then, counting with government support to fill in the gaps, Central American countries can go a long way in overcoming the digital divide. They can use ICTs as powerful tool for poverty relief, foster productivity, and enhance quality of life.
5. BIBLIOGRAPHY


