“Effectiveness of the USAID Intercultural Bilingual Approach: Access to Intercultural Bilingual Education Project”

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TABLE OF CONTENTS

TABLE OF CONTENTS **3**

INTRODUCTION **5**

METHODOLOGY **5**

MAJOR FINDINGS **6**

IMPLICATIONS **7**

I. INTRODUCTION **8**

II. BACKGROUND **8**

III. METHODOLOGY **9**

A. Study Variables 9

B. Design 9

IV. FINDINGS **10**

A. Program Implementation 10

B. Student Participation in the Classroom 11

C. Parent Participation 14

D. Internal Efficiency 14

E. Student Achievement 17

F. Cost-Effectiveness 18

V. CONCLUSIONS AND IMPLICATIONS **20**

A. Conclusions 20

B. Implications 21

VI. ANNEX **22**

LIST OF TABLES

Table 1: Participation in PAEBI Activities to Improve Educational Quality..... 11
Table 2: Participation in PAEBI Activities to Improve Parental Participation 11
Table 3: Percentage of Teachers reaching each criterion, by year 12
Table 4: Percentage of DIGEBI and PAEBI Teachers meeting all criteria..... 13
Table 5: Change in Completion Rate by Grade and Cohort: PAEBI 15
Table 6: Third Grade Progression by Cohort and Gender: PAEBI 15
Table 7: Fourth Grade Progression Rates by Cohort and Gender: PAEBI..... 16
Table 8: Fourth Grade Progression Rates by Gender and Cohort: Comparison..... 16
Table 9: Percentage Increase in Enrollment by Grade and Program 16
Table 10: Percentage Students Promoted by Grade Level and Program..... 17
Table 11: Means Scores in Reading Skills by Gender and Group 17
Table 12: Means Scores in Mathematics Skills by Gender and Group..... 18
Table 13: Cost Analysis of the PAEBI/USAID IBE Approach 18
Table 14: Cost and Effectiveness Variables..... 19
Table 15: PAEBI/USAID IBE Approach Cost-Effectiveness..... 19

Executive Summary

Effectiveness of USAID Intercultural Bilingual Education Approach: PAEBI[1]

Introduction

This document summarizes the results of a study to determine the effectiveness of the Access to Intercultural bilingual Education Project (PAEBI). PAEBI is a cooperative effort between USAID and World Learning to provide culturally pertinent education to Guatemala's indigenous population. The results reported in this study deal with the success of the project in promoting student and parent participation in bilingual education and thereby increasing learning and internal efficiency in bilingual classrooms.

PAEBI is a six-year project designed to support educational mandates of the Guatemalan Peace Accords signed in 1996. PAEBI carried out its work in collaboration with the General Directorate for Intercultural Bilingual Education (DIGEBI), the Departmental Directorate of Education (DDE) and a number of community organizations in El Quiché. The project employed four lines of action: 1) training of administrators, school directors, teachers, parents and students in primary schools and teacher training institutions in intercultural bilingual education strategies; 2) Development of culturally contextualized educational materials for use by teachers, students, and parents; 3) Increasing parent participation in decision making processes through leadership training for women, parent networks, and early childhood stimulation programs; and 4) Training and awareness building at regional and national levels through conferences, radio programs, printed matter and workshops. The project worked in 750 primary schools serving over 81,000 children over its history.

Methodology

A multi-method design, consisting of inventories, checklists, classroom observation forms, standardized tests, and focused interviews, was employed to measure the effectiveness of the PAEBI program in El Quiche. Study variables included data on the percentage of students who made normal progress through primary school as well as student achievement mathematics and language arts in both Spanish and K'iche', observations of student use of languages and participation in the classroom and interviews on parent participation. Data were collected by a team of trained MEDIR researchers at the end of every school year from 1998 to 2004.

[1] Access to Intercultural Bilingual Education Project, Proyecto de Acceso a la Educación Bilingüe Intercultural, in Spanish

Major Findings

PAEBI has improved efficiency in Project schools. The percentage of children making normal progress through PAEBI schools has been higher than that of similar schools at every grade level from the baseline year of 1998. Over the life of the Project, PAEBI cohorts of children reaching third and fourth grade have increased and average of eight percentage points. This compares to a three percent increase in non-PAEBI schools.

Thanks to the greater efficiency, the USAID IBE approach was shown to be cost-effective. PAEBI produced graduates in any and all grade at lower costs than comparison schools, in spite of the higher per student spending. The higher relative graduation rates, ranging from 20% to 33%, resulted in savings of close to Q650.00 to produce a third grade graduated.

PAEBI has had success in addressing the problem of first grade failure, even in schools where this has not been an explicit objective. In PAEBI schools without the targeted *Salvemos Primer Grado* intervention, first to second grade transition rates in PAEBI schools have consistently been above 65%, with a high of 77%. This compares to an average of about 61% in similar schools without PAEBI. In addition, increases in first grade enrollment in PAEBI schools have been double or triple that in comparison schools in each year of the Project.

PAEBI has successfully improved the classroom dynamics. Especially in the last four years of the project, PAEBI effectively helped teachers to transform their classroom into more student-centered ones, with more gender equity and with significantly more usage of the mother tongue in the daily teaching and learning interactions. However, gender equity in classroom interaction has not been achieved yet, and usage of the mother tongue continues to shows a language substitution pattern.

PAEBI has carried out activities on parent and community participation in a high percentage of project educational communities. Over 80% of PAEBI schools have participated in activities designed to encourage parent and community participation. Also, about six percent of PAEBI schools have participated in women's leadership training activities. However, little or no systematic outcomes of these activities could be identified.

Results in academic performance have been mixed in PAEBI schools. As a result of greater numbers of children in PAEBI schools being promoted, students who would normally not have the opportunity to take third grade tests participated in the study data collection. As a result, PAEBI students scored lower in Spanish reading than comparison group children. However, when the greater flow of children in PAEBI schools was controlled for, differences in reading largely disappeared. Such differences favoring the comparison group in mathematics were maintained even when greater flow of PAEBI children was controlled.

PAEBI has contributed to girls making greater progress through school. However, gender differences favoring boys persist. Girls participating in PAEBI had consistently higher percentages of grade completion than girls in the comparison group. However, PAEBI girls' completion rates were lower than those of PAEBI boys. In addition, PAEBI girls had consistently lower test scores in both reading and mathematics than PAEBI boys.

Implications

The USAID IBE can be a powerful tool for increasing internal efficiency. As the approach proves to be cost-effective as well, it should be expanded. Central to this effort are systematic in-service teacher training, of which the permanent support provided by the OTEBIS appears to be of great importance.

If the PAEBI program is to be incorporated into Ministry planning for innovations targeted for bilingual student populations, greater attention will need to be focused on mathematics learning tools, to ensure mastery of the curricular content as students advance in grade.

Gender sensitivity in PAEBI training and materials should be re-examined to assure that curricular content is fully appropriate for both girls and boys. Likewise, gender focused efforts should be continued and expanded, to further reduce gender inequities in classroom dynamics, learning outcomes and efficiency.

USAID should continue its efforts to ensure that parents' participation can bear its potential for improving educational quality. This may imply exploring new models to promote parents' participation in the school, changing the focus of participation of parents from the school to the home, or designing, developing and field testing methodologies from illiterate and near illiterates parents, so they to can help their children's learning.

Effectiveness of USAID Intercultural Bilingual Education Approach - PAEBI

I. Introduction

This document examines the effectiveness of the Access to Intercultural bilingual Education Project (PAEBI). PAEBI is a cooperative effort between USAID and World Learning to provide culturally pertinent education to Guatemala's indigenous population. The results reported in this study deal with the success of the project in promoting student and parent participation in bilingual education and thereby increasing learning and internal efficiency in bilingual classrooms.

II. Background

PAEBI was begun in 1999 to support educational mandates of the Guatemalan Peace Accords signed in 1996. The project was designed to increase access and improve quality for indigenous populations of El Quiché by introducing innovations that supported cultural and linguistic identity. Throughout its six-year history, PAEBI carried out its work in collaboration with the General Directorate for Intercultural Bilingual Education (DIGEBI), the Departmental Directorate of Education (DDE) and a number of community organizations in El Quiché. The project employed four lines of action: 1) training of administrators, school directors, teachers, parents and students in primary schools and teacher training institutions in intercultural bilingual education strategies. Such training included advanced training (*Diplomado*) for teachers, workshops for departmental technical staffs, and community based training. 2) Development of culturally contextualized educational materials for use by teachers, students, and parents. These materials included visual aids, educational games, Mayan language readers and other interactive educational materials, as well as training of teachers in the production of educational materials using local resources. 3) Increasing parent participation in decision making processes through leadership training for women, parent networks, and early childhood stimulation programs. 4) Training and awareness building at regional and national levels through conferences, radio programs, printed matter and workshops.

Over its life, the project worked in 750 primary schools, 198 pre-primary classrooms, and six teacher training institutes. It produced 2600 graduates of its *diplomado* program, 1,700 participants in the women's leadership program, and trained 1,190 teacher aides from middle schools, while serving 81,400 primary school children each year. PAEBI also began a specialized program aimed at reducing first grade wastage called Salvemos Primer Grado, which has subsequently been incorporated into the national education system. Given the specialized nature of this program and its focus on a single grade, it is dealt with in a separate report.

III. Methodology

A. Study Variables

Variables for the study were of two types: those related to students and those related to other members of the education community, particularly parents.

Student Variables. Student variables included data on the percentage of students who made normal progress through primary school. Yearly dropout and repetition rates were used to calculate completion rates at third and fourth grade levels over the life of the project. Student achievement was also measured with tests in mathematics and language arts in both Spanish and K'iche' and observations of student use of languages and participation in the classroom were made.

Parent Variables. Parent participation was measured with interviews of parents and school directors.

B. Design

A multi-method design, consisting of inventories, checklists, classroom observation forms, standardized tests, and focused interviews, was employed to measure the effectiveness of the PAEBI program in El Quiche.

Sample. The sample of schools for the study was obtained using a random, stratified sample. Schools in El Quiche were stratified by distance from a municipal center and school size. The sample size varied by the types of bilingual education programs operating in El Quiché. The sample varied from 75 schools in 1998 to 166 schools in 2004. However, internal efficiency was calculated for the 54 PAEBI schools and the 260 comparison schools on which there are complete records from 1998 through 2004.

Instruments. In order to implement the multi-method design of the research, a series of instruments were developed. These instruments included inventories of instructional materials, classroom maps, classroom observation forms, focused interviews with parents and school directors, and standardized tests of academic achievement in third grade mathematics and language arts. The inventories were used to identify both PAEBI-developed and non-PAEBI materials available in each classroom. Maps were employed to identify the characteristics of the children and teachers and to examine the context in which they interact. Classroom interaction was measured through a teacher-student interaction protocol and a student observation checklist. The former instrument focused on teachers' interactions with individual students in different contexts and the language used in different academic classroom activities. The form was used for ten minutes at six different times during the instructional day in classrooms at the first three grade levels. The student checklist was used primary to judge student engagement during lessons and consisted of several spot checks of a sample of children of different genders. Open-ended interview schedules were used to explore the behavior of parents with relation to intercultural bilingual education.

Training of Field Workers. Lic. Fernando Rubio, and the study supervisors, designed the training. Training took place over a five-day period in early August. Training was holistic in the sense that each aspect of successful qualitative research or fieldwork in the school settings was continually related to other aspects and learning was highly experiential. The general content of the training was: introduction the DIGEBI program and other programs to be examined; introduction to the study; introduction to qualitative methods, role management, use of checklists, use of observation protocol; field interviewing techniques; testing of young children, and simulation fieldwork in local schools. Training included exercises using videotapes of classroom interaction in schools, and served to pilot and refine the instruments.

Field procedures consisted of local researchers working in two-person teams and spending one or two days at each school. Field manuals were developed as a reference guide to field procedures during the investigation. Other quality control procedures included instrument editing, re-interviewing and parallel observations by supervisors with a small number of sample teachers.

Data Analysis Data analysis consisted of calculating the absolute and relative frequencies of each indicator. These frequencies were used to make comparisons between groups with different characteristics. Where appropriate, other analyses such as chi-square or analysis of variance were made. Where necessary, special indices were created to control for differences in enrollment or attendance among target groups, where such differences might affect participation.

IV. Findings

A. Program Implementation

This section examines the implementation of the PAEBI program in Project schools. Teacher professional development, distribution of educational materials, and community participation activities are examined through a survey of the Project schools. The MEDIR established, using PAEBI records, that a total of 741 schools were reached with the various project interventions. *Salvemos Primer Grado* schools, an intervention initiated in school year 2003, is not included here. A separate report has been prepared for this intervention. Likewise, other non primary level schools interventions are not reported here either. No evaluation report was ordered to the MEDIR team for these.

Table 1 shows the percentage of PAEBI schools that participated in activities designed to improve educational quality. As can be seen, the project provided professional development activities through the *diplomado* to over half of the participating schools. Similarly, 56% of the schools participated in other PAEBI professional development activities outside of the *diplomado*. A similar number of schools had received the educational materials developed by the program.

Table 1: Participation in PAEBI Activities to Improve Educational Quality

Activity	Number of schools	Percentage
Teachers participated in diplomado	397	53.6
Teachers received training	415	56.0
Instructional materials received	417	56.3

Community participation activities consisted of working with parents in terms of their role with their children's education, leadership training for women, and training in early childhood stimulation through pre-primary education. Table 2 shows that PAEBI was most successful in parental involvement activities, with 82.5% of the schools participating in such activities. Pre-primary education activities took place in 37.2% of the school communities over the life of the Project, whereas women's leadership training was provided to 6.5% of the schools.

Table 2: Participation in PAEBI Activities to Improve Parental Participation

Activity	Number of schools	Percentage
Community participation	611	82.5
Pre-primary education	276	37.2
Women's leadership training	48	6.5

B. Student Participation in the Classroom

One of the aims of the PAEBI was to introduce changes in the classroom dynamics. All in service training activities had as one of the focus improve students' active participation. Along with it, it was also sough to improve girls' active participation in the classroom, as well as increase the attention girls receive from their teachers. Being a bilingual program, the usage of the local language in the interaction was also part of the classroom dynamics the project wanted to modify. For each indicator a performance criterion for teachers was established, in such a way as to measure changes in the classroom dynamics: for student initiated interactions the criterion was set at 20% of all student-teachers interactions, for girls initiated it was set at 34% of student initiated interaction, and for Mayan language usage a grade by grade criterion was used (60% or more for preprimary, 45% for first grade, 35% for second grade and 25% for third grade).

The MEDIR team started collecting data in Quiche schools in 1999, but as the PAEBI started activities in the third quarter of 1999, the 1998 data is not presented here. In fact, PAEBI started its work at the school level in the school year 2000, so the 1999 data is a baseline data. As can be seen in table 3, little or no change was observed between the 1999 SY data and the 2000 SY, excepting for language usage. This is to be expected, as the first group of teachers participating in the *Diplomado* did so at the end of the 2000 SY. From 2001 to 2004 there was and steady increment in the number of teachers reaching the criteria for all three indicators, except for a small decrement for

active classroom (to be expected given that in 2003 a 100% was reached), as well as decrements for Mayan language usage in preprimary and third grade.

Table 3: Percentage of Teachers reaching each criterion, by year

Criterion	Grade	1999	2000	2001	2002	2003	2004
Active Classroom	Pre-Primary	73.3	80	80	94.4	100	88.5
	First grade	64.8	60.7	95.5	81.5	100	90.3
	Second Grade	68.8	72.2	87.5	92.3	100	92.0
	Third Grade	60	61.5	85.7	90	100	82.4
Gender equity	Pre-Primary	46.7	50	60	61.1	84.6	92.3
	First grade	37	60.7	45.5	70.4	80	93.5
	Second Grade	39.6	38.9	50	61.5	66.7	96.0
	Third Grade	35.6	38.5	57.1	70	80	88.2
Mayan language usage	Pre-Primary	40	66.7	70	66.7	76.9	69.2
	First grade	35.2	50	50	40.7	53.3	71.0
	Second Grade	20.8	61.1	56.3	61.5	75	76.0
	Third Grade	20	66.7	71.4	50	80	64.7

Table 4 summarizes the results comparing IBE teachers in DIGEBI schools with PAEBI teachers. Regular IBE teachers did not participate in the *Diplomado*, but could participate in other activities developed by the project (starting in 2002). As indicated previously, 1999 is baseline data. More PAEBI teachers reached the target criteria starting in 2000, and the difference between PAEBI and regular teachers widened to almost 15% by 2003. With the exception of the preprimary teachers, PAEBI teachers in all three grades improved more over time than regular EBI teachers.

The mentioned improvement trend reversed in 2004 in PAEBI, but continued to improve in regular IBE schools. Several reasons may explain this. Firs, PAEBI teachers new the project was ending, and in fact, the OTEBIS stopped visiting the schools early in SY 2004. Therefore, some teachers may have felt abandoned or disappointed, reverting then to old habits. Second, fewer teachers reported in the final year that they have participated in the *Diplomado*. This may had happened for the same reason mentioned before, or because these teachers moved into the upper grades, as it is a common practice for more experienced teachers to reclaim teaching the upper grades as a reward for teaching the more demanding lower grades. In any case, both hypothetical reasons bring questions about the continuity of the changes in the lower grades of the primary rural school. However, for the whole sample of schools, both for PAEBI, DIGEBI and comparison schools a change in the school dynamics in the expected direction was expected over the follow-up time period. Then, even though specific

continuity in a given classroom or a given grade may be in question from a SY to the next, a sustainable change in the teaching *geist* may have in fact occurred due to the project intervention.

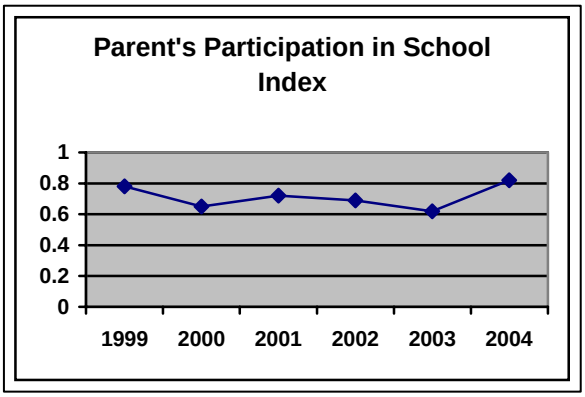
Table 4: Percentage of DIGEBI and PAEBI Teachers meeting all criteria

Program	Grade level /Year	Mastery (% of teacher meeting all three criteria)					
		1999	2000	2001	2002	2003	2004
All IBE Teachers	Pre-Primary	26.7	27.6	32.3	33.3	69.2	57.7
	First grade	7.4	3.6	13	18.5	53.3	58.1
	Second Grade	6.3	0	15.2	30.8	50	68.0
	Third Grade	4.4	0	43.8	50	60	52.9
	Total	9.6	13.4	24.8	29.4	57.8	59.6
PAEBI Teachers	Pre-Primary	na	31.6	41.2	38.5	42.9	60.0
	First grade	na	11.1	11.1	21.4	84.6	52.2
	Second Grade	na	0	20	33.3	75	31.8
	Third Grade	na	0	50	66.7	80	23.5
	Total	na	20	29	33.3	72.7	42.2

This merits an additional thought about evaluating impacts like classroom dynamics. Several aspects of the project context may it almost impossible to conduct a comparative analysis between schools and teachers benefiting from the intervention and those which did not. First, the project had a clear influence in the department school context: by the end of the SY 2000 (when the first group of teachers had graduated from the *Diplomado*, 53% of all interviewed teachers were aware of PAEBI; by the end of the 2004 77% were). With this higher project recognition came also a dissemination of the project philosophy and pedagogical approach. Second, teacher rotation from one school to other is significant, and an undetermined number of teachers moved from project schools to other IBE schools and even to comparison schools. Third, as the project develop an active role publicly supporting bilingual education, the acceptance for bilingual education grew over time, which may also have impacted on classroom dynamics. In short, a clean cut assessment of the project impact at the classroom level is in not way warranted by the educational context the same project contributed to create.

C. Parent Participation

Parents' participation in the education of their children was one of the critical elements in the USAID IBE approach as implemented by PAEBI. To track development in this aspect, a set of three indicators were developed: parents' economical and material support to the school, parents' involvement in the school management, and parents' direct support to their children's learning. This last aspect was measured both looking at the parents' support in the school (supporting the teacher in the classroom, visiting their children's teacher to monitor their progress, and looking for children safety in the school), as well as the parent support at home (supervising homework, helping with school chores, allocating time for school chores, etc.)



Contrary to other aspects of the IBE USAID approach examined in this document, no evidence was found of a systematic change of parents' participation over the life of the project. Material support was high over the life of the project, and this was the case in all schools, regardless of the intervention. School management was consistently low, with a small increase during the 1999 SY, but with a decrement over the next years. Support for children learning's slightly increased over time, but did so in other schools as well. Even then, there was a clear cut pattern of improvement over time in any type of school.

In summary, parents' participation at the school and the classroom level, and at home, even though important, does not appear to have experienced a change due to the project intervention. Figure 1 presents the Parent's Participation in School Index from 1999 to 2004.

D. Internal Efficiency

Table 5 presents the successful progression rate for the first four grades in PAEBI and comparison schools. Comparison schools Quiche are rural traditional schools, without IBE services (DIGEBI schools not part of PAEBI were filtered out), but attending a largely indigenous population. No PRONADE schools are included in the comparison schools. As can be seen, PAEBI had greater progression rates at all grade levels for all years of the program when compared to similar schools without PAEBI. Progression rates at all grade levels are at least five percentage points higher in PAEBI for all grades in all years. With the exception of the 1999-2002 cohort, there is an improvement in progression rates at each grade level each year. This is true for both PAEBI and comparison schools suggesting a general improvement of efficiency in the system as a whole. The somewhat lower rates in the 1999-2002 cohort may reflect the transition of governing parties in 2000 and the initial priorities of the new administration toward investment in adult literacy.

Table 5: Change in Completion Rate by Grade and Cohort: PAEBI

Program	Cohorts	1° to 2° %	1° to 3° %	1° to 4° %
PAEBI	98_01	77.08	56.47	45.50
	99_02	65.51	53.40	40.82
	00_03	70.25	53.70	50.54
	01_04	73.97	64.49	54.48
Comparison	98_01	62.75%	48.71%	38.96%
	99_02	58.56%	46.51%	39.36%
	00_03	64.11%	51.89%	41.98%
	01_04	NA	NA	NA

Table 6 shows the differences in third grade progression for the first four years of the PAEBI program. As can be seen, there has been an increase from the 1998 cohort to the 2001 cohort for both males and females. However, there is a drop in progression in the 1999 cohort for males and females in both groups and this trend continues among PAEBI females in the 2000 cohort. PAEBI ha higher progression rates than the comparison groups among males and females in each cohort and there is an overall change of eight percentage points in progression rates compared to slightly less that 3% for the comparison group over the years for which data were available.

Table 6: Third Grade Progression by Cohort and Gender: PAEBI

Cohorts	98_00	99_01	00_02	01_03
PAEBI Males	54.08 %	52.29 %	54.58 %	66.69 %
PAEBI Females	59.18 %	54.66 %	52.77 %	62.06 %
PAEBI_TOTAL	56.47 %	53.40 %	53.70 %	64.49 %
Males	49.17%	45.50%	52.62%	51.27%
Females	48.21%	47.75%	51.09%	51.59%
TOTAL	48.71%	46.51%	51.89%	51.42%

As might be expected, fourth grade progression rates follow a similar pattern to those of third grade. PAEBI schools have consistently higher percentages for progression than comparison schools among boys and girls. Over comparable years, PAEBI students have an increase of five percentage points, whereas comparison schools increase by about three percentage points. Boys generally have higher progression rates than girls among both groups, with the 1999 cohort being the only exception. Similarly, the 1999 cohort is the only one in either group that shows a decrease in overall progression rates. It is important to note that most of the difference in increment gains in progression rates is the result of greater gains by PAEBI males, as females in both groups have similar gains.

Table 7: Fourth Grade Progression Rates by Cohort and Gender: PAEBI

Cohorts	98_01	99_02	00_03	01_04
PAEBI Males	45.72%	39.13%	53.82%	57.19%
PAEBI Females	45.26%	42.76%	47.05%	51.50%
PAEBI_TOTAL	45.50%	40.82%	50.54%	54.48%

Table 8: Fourth Grade Progression Rates by Gender and Cohort: Comparison

Cohorts	98_01	99_02	00_03
Males	39.64%	38.88%	43.64%
Females	38.20%	39.95%	40.17%
TOTAL	38.96%	39.36%	41.98%

Greater progression rates are reflected in the higher enrollment rates at each grade level shown in Table 8. Again, for comparable years, PAEBI has consistently higher rates than comparison schools. Perhaps most impressive is the increased enrollment in first grade, indicating an increased demand for schooling in local communities. PAEBI has had a three-time greater increase in first grade enrollment than comparison schools. Also notable is the increase in fourth grade enrollment, as the transition from third grade, the end of the first cycle of primary school in Guatemala, to fourth grade has traditional been a period of high student loss. Again, the consistent increases found in comparison schools serving bilingual children shows that the Guatemalan primary education system in general is attracting more students and keeping them school.

Table 9: Percentage Increase in Enrollment by Grade and Program

Program	Grade	1999	2000	2001	2002	2003	2004
PAEBI	First	18.59%	26.59%	26.59%	33.55%	54.44%	37.88%
	Second	24.42%	25.40%	43.54%	51.15%	69.82%	76.19%
	Third	28.36%	29.23%	44.92%	55.58%	86.83%	91.09%
	Fourth	36.54%	59.04%	59.62%	69.81%	124.42%	141.92%
Comparison	First	9.78%	10.17%	11.47%	14.40%	11.02%	NA
	Second	2.43%	4.94%	15.30%	18.47%	21.65%	NA
	Third	7.07%	9.72%	15.01%	28.75%	29.10%	NA
	Fourth	0.81%	11.93%	14.52%	27.03%	35.97%	NA

Promotion levels do not show the same type of systematic improvement over time as other internal efficiency statistics. Rather, PAEBI promotion rates are relatively stable over the life of the program, in spite of the higher enrollment observed in these schools. As can be seen in Table 9, the most notable difference favoring PAEBI over comparison schools is in first grade. At this grade level, which has been targeted by the Guatemalan Ministry of Education, PAEBI is consistently between five to 16 percentage points higher than the comparison group. At other grade levels, PAEBI is consistently higher than the comparison group but differences are small, and in 2003, the last year where comparable data are available, the comparison group slightly surpasses PAEBI in second and fourth grade promotion rates.

Table 10: Percentage Students Promoted by Grade Level and Program

Program	Grade	1998	1999	2000	2001	2002	2003	2004
PAEBI	First	66.50%	62.14%	66.26%	68.38%	64.90%	64.11%	70.74%
	Second	74.16%	73.61%	75.65%	78.67%	76.52%	73.37%	77.20%
	Third	83.19%	83.09%	81.46%	83.38%	82.82%	81.40%	80.96%
	Fourth	87.31%	87.61%	88.15%	86.63%	84.60%	84.15%	87.68%
Comparison	First	50.53%	49.98%	54.76%	56.05%	53.88%	59.94%	NA
	Second	63.80%	69.43%	70.98%	72.02%	68.85%	74.59%	NA
	Third	69.49%	77.73%	76.41%	79.36%	74.67%	80.98%	NA
	Fourth	67.90%	81.50%	81.72%	83.32%	75.23%	85.18%	NA

E. Student Achievement

Student achievement was measured at the third grade level in language arts and mathematics. As tests in K'iche' were only administered in schools with intercultural bilingual programs, comparisons are limited to tests in Spanish. Table 11 shows the mean scores for PAEBI and comparison students by gender. As can be seen, the comparison group had significantly higher mean scores in both reading and compression in Spanish for both genders and in vocabulary for males. However, given the significant differences favoring PAEBI in terms of third grade completion, many more children took the test than in the comparison group. Thus, and ANOVA was run adjusting for differences in third grade completion rates. In this analysis differences between groups in terms of reading test scores disappeared in overall analyses and for girls. Differences also disappeared for males in vocabulary but were maintained in reading and comprehension.

Table 11: Means Scores in Reading Skills by Gender and Group

Subject Area	Males		Females	
	PAEBI	Comparison	PAEBI	Comparison
Reading	84.9	89.0**	83.5	87.1*
Vocabulary	86.2	89.8*	85.7	88.7
Comprehension	85.9	89.9**	84.2	87.6*

Table 12 shows that the comparison group had significantly higher scores in most areas of the third grade mathematics test. Girls in the comparison group scored better in general mathematics, operations, and arithmetic concepts. Comparison males scored significantly higher in general mathematics and arithmetic concepts. In this case, ANOVA analyses adjusting for completion differences did not alter the trends.

Table 12: Means Scores in Mathematics Skills by Gender and Group

Subject Area	Males		Females	
	PAEBI	Comparison	PAEBI	Comparison
General Mathematics	93.8	99.1**	88.1	94.6**
Operations	98.2	100.6	92.0	101.2**
Arithmetic Concepts	90.8	97.0**	86.0	90.8**
Problem Solving	98.6	101.5	95.1	95.6

F. Cost-Effectiveness

A cost analysis of recurrent costs was conducted, with the collaboration of PAEBI personnel. In each case, actual operational costs were taken into consideration. The project technical personnel structure was maintained with little changes in this analysis, assuming the MOE would have to keep this structure in order to successfully implement the approach. However, no development costs were included, not the additional costs USAID incurred when contracting World Learning to manage the program. This has the main implication that bringing the approach to a different language and cultural setting would require additional development costs. In Table 13 are summarized the results of this cost analysis. In the annex are detailed costs for the different elements of the approach.

Table 13: Cost Analysis of the PAEBI/USAID IBE Approach

Elements of the approach	Annual Costs	Cost per student per year
Personnel	Q910,664.00	Q39.26
Diplomado	Q302,610	Q13.04
Training Costs	Q247,734.00	Q10.64
Teachers and students' materials	Q550,221.12	Q23.68
Parents' training	Q117,320.50	Q5.06
Transportation costs	Q43,000.00	Q1.85
Total	**Q2,171,549.62**	**Q93.53**

It was determined that 864 teachers took the diplomado in EIB for the primary school level, and that 23,200 students benefited from it. For the purpose of this analysis, it was assumed the same amount of teachers received in service teacher training. Likewise, teachers' materials costs were estimated for this total of teachers, and students' learning materials costs for the indicated number of students. In this sense, this analysis is an average. In practice, in a given school not all teachers received the diplomado, not all teachers teaching in the first three grades were trained and not all communities received the parents' training element. Then, costs are assumed to be equal for all schools, even though that was not the case. The recurrent cost per student per year for the PAEBI/USAID approach was estimated to reach Q93.53, or a little more than $12.30 (using a Q7.60 per dollar as exchange rate).

The rate of being promoted for a given grade, up to fourth grade, as ratio of those enrolled in first grade in year 1, was the measure of effectiveness for both groups of schools. The calculation for fourth graders in the PAEBI schools is presented to examine if there is any carry over effect beyond third grade, as PAEBI did not focus its work on the upper grades. It is assumed that all PAEBI schools received all the IBE approach elements, even though this was not the case. Therefore, as with the cost analysis, the measure of effectiveness is assumed to be the product of all the elements of the approach.

Table 14 summarizes the variables use for the cost effectiveness analysis. MOE cost per student per year for 2003 (last available data) were estimated by the MEDIR team to be Q1269.00, or around $170.00. This was assumed to be the cost for all yeas under analysis. As presented before, the PAEBI/USAID IBE approach has a cost of Q93.53, which represents about 7.42% increased over the annual MOE costs.

Table 14: Cost and Effectiveness Variables

Cost and Effectiveness Variables	Salvemos	Rural Quiche
a) MOE cost per student per year (2003 costs)	Q1269.00	1269.00
b) PAEBI/USAID IBE approach Cost per student per year	Q93.53	na
c) First grade promotion rate	56.1%	68.4%
d) Second grade promotion rate as % of first grade enrollment	44.8%	56.6%
e) Third grade promotion rate as % of first grade enrollment	41.4%	52.5%
f) Fourth grade promotion rate as % of first grade enrollment	35.8%	47.8%

The major internal efficiency of the model means that in every grade more students are promoted to the next grade: for each 1000 enrolled students, for first grade 123 students more were promoted to second grade, 118 to third grade and 120 to fourth grade. This represents a relative higher efficiency between 22% (first grade) to 33.6% (fourth grade) for the PAEBI schools when compared to regular rural (non PRONADE) Quiche schools without IBE.

Table 15: PAEBI/USAID IBE Approach Cost-Effectiveness

Grade	Cost of a graduate		Savings
	Quiche	PAEBI	
First Grade	Q2,264.21	Q1,992.45	Q271.76
Second Grade	Q1,586.69	Q1,127.82	Q730.62
Third Grade	Q1,178.87	Q1,263.49	Q646.00
Fourth Grade	Q1,089.86	Q1,239.99	Q495.87

Table 15 summarizes the cost effective analysis. The PAEBI/USAID IBE approach proves more cost effective in each grade, resulting in savings when producing a graduated in any given grade.

V. Conclusions and Implications

A. Conclusions

PAEBI has improved efficiency in Project schools. The percentage of children making normal progress through PAEBI schools has been higher than that of similar schools at every grade level from the baseline year of 1998. Over the life of the Project, PAEBI cohorts of children reaching third and fourth grade have increased and average of eight percentage points. This compares to a three percent increase in non-PAEBI schools.

Thanks to the greater efficiency, the USAID IBE approach was shown to be cost-effective. PAEBI produced graduates in any and all grade at lower costs than comparison schools, in spite of the higher per student spending. The higher relative graduation rates, ranging from 20% to 33%, resulted in savings of close to Q650.00 to produce a third grade graduated.

PAEBI has had success in addressing the problem of first grade failure, even in schools where this has not been an explicit objective. In PAEBI schools without the targeted *Salvemos Primer Grado* intervention, first to second grade transition rates in PAEBI schools have consistently been above 65%, with a high of 77%. This compares to an average of about 61% in similar schools without PAEBI. In addition, increases in first grade enrollment in PAEBI schools have been double or triple that in comparison schools in each year of the Project.

PAEBI has successfully improved the classroom dynamics. Especially in the last four years of the project, PAEBI effectively helped teachers to transform their classroom into more student-centered ones, with more gender equity and with significantly more usage of the mother tongue in the daily teaching and learning interactions. However, gender equity in classroom interaction has not been achieved yet, and usage of the mother tongue continues to shows a language substitution pattern.

PAEBI has carried out activities on parent and community participation in a high percentage of project educational communities. Over 80% of PAEBI schools have participated in activities designed to encourage parent and community participation. Also, about six percent of PAEBI schools have participated in women's leadership training activities. However, little or no systematic outcomes of these activities could be identified.

Results in academic performance have been mixed in PAEBI schools. As a result of greater numbers of children in PAEBI schools being promoted, students who would

normally not have the opportunity to take third grade tests participated in the study data collection. As a result, PAEBI students scored lower in Spanish reading than comparison group children. However, when the greater flow of children in PAEBI schools was controlled for, differences in reading largely disappeared. Such differences favoring the comparison group in mathematics were maintained even when greater flow of PAEBI children was controlled.

PAEBI has contributed to girls making greater progress through school. However, gender differences favoring boys persist. Girls participating in PAEBI had consistently higher percentages of grade completion than girls in the comparison group. However, PAEBI girls' completion rates were lower than those of PAEBI boys. In addition, PAEBI girls had consistently lower test scores in both reading and mathematics than PAEBI boys.

B. Implications

The USAID IBE can be a powerful tool for increasing internal efficiency. As the approach proves to be cost-effective as well, it should be expanded. Central to this effort are systematic in-service teacher training, of which the permanent support provided by the OTEBIS appears to be of great importance.

If the PAEBI program is to be incorporated into Ministry planning for innovations targeted for bilingual student populations, greater attention will need to be focused on mathematics learning tools, to ensure mastery of the curricular content as students advance in grade.

Gender sensitivity in PAEBI training and materials should be re-examined to assure that curricular content is fully appropriate for both girls and boys. Likewise, gender focused efforts should be continued and expanded, to further reduce gender inequities in classroom dynamics, learning outcomes and efficiency.

USAID should continue its efforts to ensure that parents' participation can bear its potential for improving educational quality. This may imply exploring new models to promote parents' participation in the school, changing the focus of participation of parents from the school to the home, or designing, developing and field testing methodologies from illiterate and near illiterates parents, so they to can help their children's learning.

VI. Annex

Cost Analysis of Recurrent Cost for the PAEBI/USAID IBE Approach

Programs Elements	Unit	Unitary Cost	Cost per year	Cost per student per year
1. Personnel				
Program Coordinator[2]	1	Q75,600.00	Q75,600.00	Q3.26
Secretary	1	Q10,100.00	Q10,100.00	Q0.44
OTEBIS Supervisors[3]	2	Q40,572.00	Q81,144.00	Q3.50
OTEBIS[4]	22	Q33,810.00	Q743,820.00	Q32.06
Sub-total			**Q910,664.00**	**Q39.26**
2. Training				
Personnel training days[5]	490	Q93.00	Q 45,570.00	Q 1.96
OTEBIS training kit	22	Q78.00	Q 1,716.00	Q 0.07
Teachers' training materials	864	Q232.00	Q200,448.00	Q 8.61
Sub-total			**Q247,734.00**	**Q10.64**
3. Diplomado				
Teachers' Trainers hours[6]	150	Q885.00	Q 764,640.00	Q8.24
Teachers' modules design and production	10		Q120,000.00	Q1.29
Training coordinators	6		Q 55,800.00	Q0.60
Teachers' transportation (weeks)	25	Q312.50	Q270,000.00	Q2.91
Sub-total without discount			**Q1,210,440.00**	
Subtotal for one year			**Q302,610**	**Q13.04**[7]
4. Teachers and students materials				
Teachers' kit	864	Q390.00	Q336,960.00	Q14.49
Students' learning materials kit, without discount	864	Q740.49	Q639,783.36	Q9.19[8]
Sub-total (discounting students' kit)			**Q550,221.12**	**Q23.68**
5. Parents training				
Training of women's guides (2 per community, 415 communities)	415	Q206.00	Q85,490.00	Q3.69
Training of parents (Training modules, training kit, 2 per community))	415	Q76.70	Q31,830.50	Q1.37
Sub-total			**Q117,320.50**	**Q5.06**

[2] College graduated, at least 10 years of experience
[3] Class C teacher, fully bilingual
[4] Class B teacher, fully bilingual
[5] 10 days for program coordinator, and 20 days for OTEBIS supervisor and OTEBIS.
[6] At Q118.50 the teaching hour, for 150 hours, for 43 instructors, each one attending groups of 20 teachers
[7] As teachers in Quiche remain in average 4.5 years in a given school, the total amount is arithmetically discounted in four years. In other words, a trained teacher will impact on four different group of students.
[8] The student's learning kits are estimated to have a life cycle of three years, and therefore per student's costs are divided by 3

Programs Elements	Unit	Unitary Cost	Cost per year	Cost per student per year
Transportation costs				
OTEBIS monthly transportation costs (22 OTEBIS)[9]	10	150	Q33,000.00	Q1.42
OTEBIS supervisors monthly transportation costs (2 supervisors)	10	500	Q10,000.00	Q0.43
Sub-total			**Q43,000.00**	**Q1.85**
Grand Total			**Q2,171,549.62**	**Q93.53**

[9] Estimated at Q10.00 per day, per 15 days a month