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EVALUATION OF THE BILINGUAL EDUCATION COMPONENT OF THE  
RURAL EDUCATION I PROJECT (AID LOAN No. 511-V-054)  
IN COCHABAMBA, BOLIVIA

July 1978

I. GENERAL BACKGROUND

The majority of Bolivians speak either Quechua or Aymara as their native language. Of the 5,600,000 inhabitants, 36% speak Spanish, 27% speak Aymara, 34% speak Quechua, and 3% speak other Indian languages, but with the exception of a bilingual program among the minority groups in small, remote jungle tribes, the official language of school is Spanish, "the language of upward mobility." Bolivian schools follow the national, urban-oriented curriculum and the few teaching materials that exist are written in Spanish.

Spanish language arts are taught the same in all parts of the country, whether or not the student is a native speaker of the language. The concept of a separate Spanish-as-a-second language approach, based on a contrastive analysis of Spanish and the particular native language of the student, has not yet influenced textbook producers. On the other hand, judging by a teacher survey done in the Department of Cochabamba, most rural teachers are bilingual in Spanish and the Indian language of the region and they do employ the vernacular orally in the classrooms as an aid to student comprehension. A Rural Education seminar in Cochabamba (July, 1976) specifically recommended the preparation of didactic materials - "adequate to the linguistic, social and geographical needs of rural, vernacular-speaking community."

Nevertheless, 30% of the rural students that enter first grade drop out before reaching fourth grade (Diagnóstico Integral de la Educación Boliviana, MEC. Dirección Nacional de Planeamiento Educativo, Julio 1973). Traditional curriculum administrators interviewed as part of the present study\* attribute the causes of school dropouts principally to social and economic reasons outside of the tractability of school. None of these educators thought that changing the curriculum, or, more especially, teaching students in a language the students could understand, would alter the enormously high dropout rate. Educational administrators and rural teachers in the District of Cochabamba tend to attribute dropout rates to lack of supplies and appropriate teacher training, as well as to social and economic conditions in the students' homes. In contrast, all bilingual teachers interviewed in July 1978 (33) thought bilingual education would lower the dropout rate.

Clearly, implementation of the bilingual education approach was merited. USAID/B, in conjunction with the Ministry of Education and Culture, developed a project paper to launch a reform of rural education. An ambitious socio-

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linguistic survey of over 200 communities, selected for national representativeness, was initiated but subsequently interrupted before the data were analyzed. By January, 1976, an AID-MEC loan agreement had been signed to initiate educational reform in the District of Cochabamba. Four major project components were identified: (1) a rural teacher education and inservice training program; (2) a curricula reform and materials improvement program; (3) the redesigning, remodeling and expansion of multipurpose nuclear schools and the Rural Normal School at Vacas; and (4) a wide range of non-formal educational projects. Bilingual education, according to the loan agreement, was scheduled to be a subcomponent to two of these four components; the rural teacher education and inservice training program and the curricular reform and materials improvement program. Additionally, some of the non-formal units were expected to be developed in Quechua.

Confusion concerning the precise role of bilingual education within the project was to plague the project from its inception. While it was generally understood that bilingual education was to be implemented on an experimental basis to see how it worked, there was sharp divergence of opinion concerning the extent of the experiment. Some project leaders tended to view the bilingual experiment as a relatively small experiment within the project, while the Bilingual Team leaders tended to see it as a much more important aspect of the Rural I Project, i.e., bilingual education as a possible major experiment to be compared to traditional instruction in comparable schools not in the RE I project. The Project Paper (PP), which might have helped clarify the issue, was never translated into Spanish and the English version was not readily available. While the PP lists "bilingual education" as one of the four major project components, the loan agreement substituted the

aforementioned component #3 for it, and relegated the focus of bilingual education activities to a subcomponent category under curriculum development.

The widespread reluctance to implement many bilingual programs, even on an experimental basis, was explained by those in charge of the Rural Education I Project to be the logical outgrowth of an alleged resistance to vernacular education on the part of parents, community leaders, and teachers.

To highlight bilingual education, it was believed, would jeopardize the whole project. However, when all teachers of the 22 project nucleos were polled in November 1977 (see Appendix A), the vast majority were strongly in favor of being involved in a bilingual education program. Of the 20 communities whose parents and leaders were contacted in June 1978, all exhibited a positive attitude toward bilingual education. Nevertheless, the project administration suggested (July 1977) that the bilingual education experiment be limited to one of the 22 nucleos embraced by the project. The bilingual education team argued to increase the number of bilingual nucleos and on September, 1977, an oral agreement was made to designate 6 nucleos as bilingual and 16 nucleos for piloting the reformed curriculum produced by the Curriculum Team working solely in Spanish. The language of the loan agreement was frustratingly ambiguous in terms of the extent to which bilingual education was to be implemented. The project personnel belonging to the Curriculum Development and the Bilingual Education groups proposed in July, 1978 to expand bilingual education to all first grade classes in all 22 nucleos by 1979, and to all second grade classes by 1980. This

was agreed to by the project leaders. The reformed (monolingual Spanish) curriculum is to follow the current first graders through school but it is not to initiate any programs with new students.

A second frustration experienced by the bilingual team was the lateness of getting its 8 members on board. While the reformed curriculum team was fully constituted and working by July, 1977, the bilingual team did not begin to function as a 2-man team till August, 1977, two additional team members began work on February, 1978, and the final two in April, 1978. Unlike the reformed curriculum team, the bilingual team was not authorized a secretary, a graphic artist, or a mimeograph operator.

A third frustration experienced by the bilingual team was that the reformed curriculum team went well beyond its duties as outlined in the loan agreement, which limited its responsibilities to outlining the scope and sequence of each grade level, to encompass the production of curriculum classroom aids, a responsibility of the bilingual team. Unfortunately, the reformed curriculum guides and materials which this curriculum team developed do not even mention the possibility of teaching through the medium of Quechua! The reformed curriculum team did approach the teaching of Spanish language arts from a second language perspective but it did not base this instruction on a contrastive analysis, either from a phonemic, grammar, or lexical perspective, of the two language systems. Although the bilingual team incorporated in its bilingual curriculum a number of

objectives generated by the reformed curriculum group, it was clear to both teams that two completely disparate curricula were being developed.

Hindsight clearly shows that relegating the bilingual team to be a subcomponent of the curriculum team was not a desirable way to organize the development of a bilingual curriculum. It would have been more efficient for the curriculum team to have been a subcomponent of bilingual education.

A fourth frustration that continues to bedevil the bilingual team is the excessive bureaucratic delay in getting authorization to make necessary purchases, to initiate training programs, or to do virtually anything that requires higher approval. Several examples will suffice to illustrate this. In August, 1977, the bilingual plan was presented to the University New Mexico team, critiqued, revised and then submitted to the project administration in early October, 1977, for approval. The local project administrator approved the plan in June, 1978, and submitted it to the La Paz coordinator. To date there has been no response from La Paz. A second example is that permission to run the initial training program for the new bilingual teachers was requested in November, 1977. Oral authorization was given in January, but funds to implement the course were not received until March 29, 1978, well after the initiation of the school year. Authorization to conduct the July in-service training was transmitted orally (and erroneously) one working day before the training was to commence, and then rescinded near the close of the program. Few, if any, of the memos written by the bilingual team have been answered in writing, and most have

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not been answered either in writing or orally. Had the bilingual team waited for formal approval for their work, little would have been accomplished and the project's goals would have been crippled.

## II. BASELINE DATA: INPUT VARIABLES

Data have been collected by the bilingual education team on the following variables through four different survey instruments:

### Teacher variables:

Name

Nucleo

School

Sex

Age

Civil state

Whether normal school graduate

Number of years teaching experience (per grade; in central school; in sectional school).

Which is preferred grade to teach

First language (Spanish, Quechua) (See also: Resumen del Diagnóstico, 1-5).

Where second language was learned (home, school, other) (See also: Resumen del Diagnóstico, 9-10).

Adequacy of instruction in reading, writing, oral Spanish, and math as judged during a visit by bilingual team member

(good, average, deficient)

Whether teacher resides in the community where he/she teaches.

Attitude toward use of Quechua (see: Resumen del Diagnóstico, 11-20).

Where lived and studied as a child (see: Resumen del Diagnóstico, 6-8).

Student variables:

Name

Teacher

Nucleo

School

Grade

Year of data entry

Date of birth (day, month, year)

Number of older brothers

Number of younger brothers

Birth order of child in terms of his/her brothers/sisters

Sex

Personal characteristics:

Deaf

Left-handed

Happy/outgoing ("alegre")

Taciturn

Timid

Agressive

Linguistic classification:

Monolingual Quechua-speaker

Incipient bilingual

Subordinate bilingual

Coordinate bilingual

Monolingual Spanish-speaker

**School history:**

Preschool

Beginner

Repeater

Years in school

Previous attendance record (good, average, deficient)

Grades (good, average, deficient) in reading, writing, oral  
Spanish, math.

Number of days attended school in year

Number of absences during school year

Scores in tests administered as part of independent evaluation

School variables

Adequacy of classrooms (adequate, inadequate)

Adequacy of furnishings (sufficient, absent)

Number of students enrolled

Number of students in attendance during visit from bilingual  
team member

Whether student attendance was regular or irregular

Number of lesson students were studying in reading, writing,  
oral Spanish, and math, during visit from bilingual team  
member

Whether school lunch ("desayuno escolar") is offered students

Community variables:

- Whether there was a meeting with parents and/or community leaders
- Type of presentation used in community meeting (verbal explanation or "classroom" demonstration)
- Reaction of participants to community meeting (very positive, positive, reserved, negative).
- Whether community desired adult literacy instruction
- Average distance traveled by students to get to school (15 min., 30 min., 45 min., over 45 min.)

All of the foregoing variables, with the exception of the student variables to be collected at the end of the year, have been placed on tables by the evaluator to facilitate summarizing and transfer to computer tapes (see Appendix C).

To provide a "feeling" for this data, the following brief description of the program is based on statistics already collected.

Teachers: Average age of the teachers is 31; half are males and half females; 85% are married; all but one is graduate of a normal school. The average teaching experience encompasses three years in a central school and six years in a sectional school. Of this teaching experience, four years were spent teaching first grade, three years teaching second, a year and a half average experience teaching third, one year teaching fourth, and a little less than one year experience in fifth. All but two teachers

received a rating of "satisfactory" in Quechua. 63% of the teachers reside in the community where they teach. 32% of the teachers are currently teaching more than one grade level.

School setting: Only one-third of the classrooms and furnishings were judged adequate. Three percent of the schools have no furnishings. The average classroom enrolls 25 students in first grade; 19 students were, on the average, present during a random day in June, 1978. In 69% of the cases student attendance is irregular. Lunch is offered in 55% of the schools.

Community characteristics: Meetings with parents and community leaders have taken place in 60% of the communities with bilingual programs, and the reaction, on a 4-point scale, was "very positive" in 21% of the cases, and "positive" in 79%. In 84% of these communities, adult literacy programs were requested (there are no project plans to provide them). In 62% of the cases, students live 45 minutes or more away from the school.

### III. OUTCOME MEASURES

To measure the relative impact of the bilingual program as compared to schools using either a "reformed curriculum" (developed by the Curriculum Team of Rural I) or the traditional Bolivian curriculum (used in schools outside of the project), two types of outcome measures, archival and test data, will be entered in the records of all nucleos (a central school plus its "sectional" satellite schools) that participate in the experiment (see Section IV).

The archival data is available, by school, in the Supervisory offices of Prof. Trigo (the data are tabulated by an employee, Wilge Torrico Calvi) in Cochabamba. They exist in the following form:

Archival Data:

Inscritos (matriculados)

Efectivos (asistentes)

Retirados (los que abandonaron sus estudios por cualquier razón)

Reprobados (los alumnos que deben repetir el curso)

Aprobados (los alumnos que pasan al grado superior)

From these numerical data, percentages (of dropouts, students passed and flunked) can be calculated for each school and nucleo in the experiment.

In addition to these data which are available several weeks after the close of the school year, the following additional data are available from the records of classroom teachers: average daily attendance, by grade level (this needs to be calculated from attendance records).

(The names of the students in any of the above categories are also available as an input variable from the teachers records.)

Test Data:

A norm-referenced, objective test of academic achievement in reading, writing, oral Spanish, and mathematics will be administered to each child in the experiment who is available for testing at the close of each school year.

Format for Test (Grade 1)

Reading comprehension will be tested on the first grade level through 2 or 3 reading selections, controlled for structural and lexical appropriateness followed by approximately 10 multiple-choice items. While the test will be read silently by the student, the responses may be orally administered by the teacher or tester and the responses marked on the test sheet. Since regular-school first graders have had no opportunity to read Quechua, their reading selection will be in Spanish, while the bilingual students will be given a selection in Quechua for analogous reasons. Second and third grade students will be tested in both Quechua and Spanish. Great care must be taken to produce equivalent (but not translated) texts, one in Spanish, the other in Quechua.

Writing ability will be tested through dictation. Approximately 10 words will be dictated by the tester. The first three words will be scored for legibility, the other 7 words for correctness. Each word (i.e., item) is worth 0 or 1 points. As before, Spanish words will be dictated to the control classes and words of similar difficulty in Quechua for the bilingual classes.

Oral Spanish Comprehension will be tested by having the tester read two times each of ten sentences of graduated difficulty and requiring the students to mark an appropriate response on an answer sheet. For example, the tester might say, "yo quiero una pelota", and the student would put an X on the drawing of a ball provided by the answer sheet. The same items

would be given treatment and control students.

Mathematics will be tested by approximately 10 items of graduated difficulty. Any necessary explanations will be provided orally in the language of student preference.

Timeline for Test Construction. This test of approximately 40 items, taking a maximum of 20 minutes per subtest to administer, will be jointly developed by the bilingual and the reformed curriculum teams.

Timeline

July 78	August 78	September 78	October 78
Test Development	----> pilot in several schools	----> revise--> print	----> administer, October 16-27

Other outcome measures, such as teacher attitudes toward both languages and cultures (Hispanic and Quechua) and parental satisfaction with the school program, will be measured if the necessary instruments can be scheduled for development.

IV. EVALUATION DESIGN

A. Selection of Schools. The Rural Education I project encompasses 22 nucleos. These were classified by a sociologist according to their socioeconomic characteristics, with A-type communities being relatively modern and Spanish-speaking; with C-type communities being isolated and Quechua-speaking B-type communities were those half-way in between. The Bilingual Team identified 2 B-type nucleos and 10 C-type nucleos to be candidates for a bilingual education program. Slips with the

name of each of the 12 nucleos were then prepared. Two drawings were made (one for each type of nucleo) out of a motorcycle helmet. The drawn slips were designated as bilingual experimental and the remaining 6 slips (i.e., nucleos) were designated as control schools. (The project's chief administrator later switched one pair of schools in order to have a bilingual nucleo within convenient travel of visitors to the project.)

To validate independently the comparability of the bilingual and control schools, a meeting was held with 10 of the 11 zone supervisors and the district director (all are non-project personnel.) They were given 22 slips of paper, each with the name of a nucleo, and were directed to place them in as many or few piles as they wanted. No criterion was given to aid the classification other than to request that all the nucleos within any classification be similar enough to be able to compare school achievement between any pair of nucleos. The selection process took approximately one hour. The author interrupted only to select randomly various pairs from within a given classification to ask whether those two nucleos were comparable. At the end, 3 categories were used; the criteria for classification was very similar to those used by the sociologist several years before.

The supervisors were then asked to classify 69 nucleos that were outside of the 22 project nucleos. This list of outside projects was then brought to the attention of the Bilingual Team. They were asked to select from the appropriate category (B or C) the non-project nucleo

geographically closest to each of the bilingual nucleos. The writer then designated these nucleos as non-project control. This process has selected 6 bilingual nucleos, 6 reformed curriculum nucleos, and 6 non-project traditional curriculum nucleos. (A nucleo has not yet been selected as control for Quwari and Challacara.)

The following nucleos were selected to be in the experiment:

<u>Bilingual</u>	<u>Reformed Curriculum</u>	<u>Traditional Curriculum</u>
Boquerón Q'asa	Cañadas	Rodeo
Copacabana	Pisqumayu	Lope Mendoza
Quwari	Challacara	-- (to be selected)
Laymiña	Sacabambilla	Chimboata
Novillero	Tucwa Baja	Taboada
Melga	Ilurigrande	Candelaria

B. Type of Comparisons

This selection of sites permits the following comparisons over the length of the project:

	1978	1979	1980
1st. Grade	B-RC-TC	B-TC	B-TC
2nd. Grade		B-RC-TC	B-TC
3rd. Grade			B-RC-TC

B = bilingual curriculum

RC = reformed curriculum

TC = traditional curriculum

C. Data Collection

The following is the schedule for the collection of outcome data for the 18 nucleos in the experiment.

	1er Año			2do Año			3er Año			4to Año			
	1er Grado	2do Grado	3er Grado	1er Grado	2do Grado	3er Grado	1er Grado	2do Grado	3er Grado	1er Grado	2do Grado	3er Grado	4to Grado
<b>Datos de los Archivos:</b>													
Asistencia	X			X	X		X	X	X				
Deserción	X			X			X	X			X	X	X
Repitencia	X			X			X	X					X
Promoción	X			X	X		X	X	X				
Transferencia	X			X			X	X					
<b>Pruebas:</b>													
<b>Lectura</b>													
Español	C			C	X		C	X	X				
Quechua	B				X		B	X	X				
<b>Escritura</b>													
Español	C			C	X		C	X	X				
Quechua	B			B	X		B	X	X				
<b>Comprensión Oral</b>													
Español	X			X	X		X	X	X				
Quechua									X				
<b>Matemáticas (bilingüe)</b>													
Español	X			X	X		X	X	X				
<b>Otras Materias</b>													
Español				X	X		X	X	X				
<b>Satisfacción de padres de familia</b>													
Español				X	X		X	X	X				
<b>Actitud de Profesores: lengua/cultura</b>													
Español				X	X		X	X	X				

B = Bilingüe  
 C = Control  
 X = Ambos, bilingüe y control.

To accomplish this testing, 6 teams of 2 people each will be formed. Each team will test one nucleo in each condition during a 2-week period the first year, and in 3-week periods the second and third years. (It may be necessary to add a third team member the last two years). Those members of the team who are involved in classroom testing, or observation of classroom testing, must be bilingual in Quechua and Spanish. (Project administrators need not be bilingual). The general testing procedure to be followed consists of the team testing first the central school, then having the central school teachers whose students were tested assist the team in testing the sectional school.

The following schedule shows how the testing would be organized for the first year.

LOGISTICA DE EQUIPOS DE EVALUACION - OCTUBRE 1978

C A R No. A

C A R No. B

C A R No. C

TEAM 1C	TEAM 2C	TEAM 3C	TEAM 4	TEAM 5	TEAM 6
<b>BILINGUAL EDUCATION</b>  Boquerón Q'asa  2 Central Teachers  4 Sectional Schools  2 days required	A. Copacabana  2 Central Teachers  4 Sectional Schools  2 days required	Guwani  1 Central Teacher  3 Sectional Schools  2 days required	Laymiza  1 Central Teacher  4 Sectional Schools  3 days required	Novillero  1 Central Teacher  3 Sectional Schools  2 days required (- 2 days travel)	Melga  2 Central Teachers  6 Sectional Classrooms  2 days required
<b>REFORMED CURRICULUM</b>  Cañadas  7 Sectional Schools  (2 local teach.)  3 days required	Pisqumayu  4 Sectional Schools  (2 local teach.)  2 days required	Challacaca  7 Sectional Schools  (2 local teach.)  3 days required	Sacanvilla  5 Sectional Schools  (2 local teach.)  3 days required	Tucuma Baja  7 Sectional Schools  (2 teach.avail.)  3 days required	Iluri Grande  7 Sectional Schools  (2 teachers)  3 days required
<b>TRADITIONAL CURRICULUM</b>  Rodeo	Lope Mendoza		Chimboata	Taboada	Candelaria

D. Data Analysis

Data will be transferred to computer tape, preferably in Cochabamba (CENACO), then analyzed in La Paz. Rafael Martínez of CRA may be available to supervise data analysis.

Analysis of variance between student achievement in the 3 conditions (bilingual education, reformed curriculum, traditional curriculum) will be effected, and the input variables will be factored to determine what additional characteristics account for variance in outcome measures. (It should be noted that Quechua is used orally in all three conditions).

An approximate, ball-park estimate of the cost of effecting this evaluation follows. The cost estimates are divided into 4 categories: the comparison group testing; the sociolinguistic survey; dropout study; teacher and student language usage study.

1. Bilingual Comparison Group Testing

(6-6-6 nucleos)

6 members project staff x 15 days ea. x 180 pesos	US\$ 810
6 members from outside project x 20 days ea x 180+ stipend \$85	US\$ 1,580
2 clerks to tabulate data in preparation for putting on (3000 per mo.) computer tape x 2 mo.ea.	US\$ 600
1 secretary x 3 mo.	US\$ 525
5 hrs. computer time at \$150 per hr.	US\$ 750
100 terminal time at \$bs. 120 per hr.	US\$ 600

1 statistician x 3 mo. (w/fringes & per diem)	US\$ 900
1 director of evaluation x 3 mo.	US\$ 900
3 jeeps for 15 days (including gas & maintenance)	US\$2,250
1 technical advisor x 1 mo. (w/fringe, travel, and per diem)	US\$4,000
1 IBM typewriter rental (3 mo.)	US\$ 150
Rental of office facilities x 3 mo.	US\$ 600
Supplies	US\$ 450
6 sleeping bags, 6 lanterns, etc.	US\$ 450
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Cost per year	US\$14565
x 3 years	<hr/> <u>43695</u>

2. Tabulation, Computation, Analysis and Report  
Writing for National Sociolinguistic Survey and  
Community Profiles.

2 clerks to tabulate data for computer proces- sing x 5 mo. ea.	US\$1,500
1 secretary x 6 mo.	1,050
20 hrs. computer time at \$150 per hr.	3,000
200 hrs. terminal time at \$b.120 per hr.	1,200
1 statistician x 5 mo.	1,500
1 project manager x 6 mo.	1,800
1 project technical advisor x 2 mo.	4,160
Rental of office work area facilities x 6 mo.	1,200
Supplies	<hr/> 1,500
	US\$ 16,910

3. Drop out Study

200 randomly selected interviewers with each school  
teacher, family, community leader, and desertee  
(100 students in each of 3 randomly selected nucleo  
who drop out between 1st and 2nd grades)

Team of 2 interviewers working 7 weeks (6 interviewers  
per day (3 each), 3 days per school, 12 days per  
nucleo, 3 nucleos = 35 working days

US\$ 900

2 weeks to design instrument and pilot

2 weeks to tabulate data after collection

1 week to reproduce instruments, etc.

Transportation: 1 jeep x 2 mo.

1,100

10 hrs. computer terminal at \$b.120 per hr.

60

1 hour computer time at \$150 per hour

150

1 statistician x 2 weeks

200

1 secretary x 4 mo.

700

1 project director x 4 mo.

6,000

Supplies

450

US\$ 9,560

4. Survey of student and teacher language and other  
input variable

Format teacher/community input data for control schools

Gather above data

Test teacher classification of student language classifications

the variance in outcome measures.

3. The resources of the background education unit of the Rural Education I project need to be enhanced and/or augmented by:

- a) Reviewing the administrative structure within which the bilingual education unit operates, with a view to increasing their ability to do their jobs especially at that point in time when the curriculum team will have finished the scope and sequence outline of the third grade;
- b) Increasing the unit's personnel to include additional professionals to work in teacher training and classroom supervision, due to the planned expansion in the number of classrooms to be initiating bilingual education;
- c) Increasing the unit's support personnel to include a secretary, a graphic artist, and a mimeograph machine operator-messenger person;
- d) Greatly expediting approvals for the bilingual plan and budget expenditures, especially supplies, printing, and teacher training expenses such as per diem for participants;
- e) Monitoring closely the compliance with the July agreement to expand bilingual education to all 22 nucleos and to limit implementation of the reformed curriculum to following the students currently studying that curriculum (in 16 nucleos) through their third grade;

- f) Adding to the curriculum plans for 4th through 8th grades provision to teach Quechua as a continuing language;
  - g) Augmenting the bilingual program effect on a community by scheduling regular meetings with professionals working in radio communication, non-formal education, adult education, community development, etc.
4. Assistance reaching the classroom teacher (bilingual and other) needs to be dramatically increased by:
- a) Seeing that supplies expeditiously reach the teacher;
  - b) Undertaking an immediate remodeling of many of the classrooms.