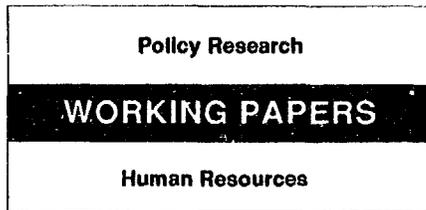


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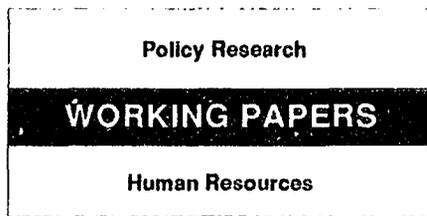
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Achievement Evaluation of Colombia's *Escuela Nueva*

Is Multigrade the Answer?

George Psacharopoulos
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and
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Other things being equal, students in Colombia's innovative multigrade rural school program achieve higher achievement scores than their counterparts in traditional schools — at unit costs that appear to be only 5 to 10 percent higher.



WPS 896

This paper — a product of the Human Resources Division, Technical Department, Latin America and the Caribbean — is part of a larger effort in to assess the quality of primary education in the region. Copies of the paper are available free from the World Bank, 1818 H Street NW, Washington, DC 20433. Please contact Liliana Longo, room 14-187, extension 39244 (April 1992, 21pages).

In the mid-1980s, half of Colombia's rural schools did not offer complete primary education and more than half of rural children between the ages of 7 and 9 had never attended school. Unitary schools — multigrade classrooms taught by one teacher — were established in the early 1960s in isolated rural areas with few students, but when efforts were made to expand the program nationally several problems became apparent — with teacher training, with the automatic promotion system, and with the relevance of course content to rural life.

Escuela Nueva was created in the 1976 as an official improvement on the unitary school. By 1978, more than 500 schools were involved; another 1,500 were added by 1982. Further expansion, partially financed by the World Bank, increased enrollment to 17,948 schools by 1989, serving 800,000 students.

Escuela Nueva is a rural school in which one or two teachers offer all five years of primary education in one or two multigrade classrooms. Promotion is flexible, but not automatic; the student is promoted to the next level once s/he accomplishes the minimum educational objectives, which could take more than one academic year. (This system alters the system of automatic promotion to which there were objections.)

Special instructional materials are used, including manuals for teachers and supervisors and student guides that facilitate individual and group work. Curriculum and materials encourage the practical application of what is learned to life in a rural community. Teachers and supervisors get special training in how to involve the community and how to use the new educational materials, student guides, and the student library. Each educational district has a demonstration school.

The system supports peer instruction, with older students coaching younger ones. The schools have study corners focused on different subject areas and a

small library that also functions as a community information center. Many activities — such as an agricultural calendar and a county monograph — are designed to involve parents in support of their children's learning.

A self-monitoring mechanism allows students to monitor their own attendance records; they can communicate concerns and problems through a suggestion box. Student progress is monitored in a progress control book, geared to mastery of activities and the flexible promotion concept.

A traditional school follows a national curriculum, does not give slow learners special attention, and does not stimulate students with special materials.

Psacharopoulos, Rojas, and Velez evaluated a 1987 sample of more than 3,000 third and fifth graders from 168 *Escuela Nueva* and 60 traditional schools (a control group). They found that *Escuela Nueva* had significantly improved student outcomes and student and community participation, as well as reducing dropout rates.

And their preliminary findings suggest that this was done at a unit cost only 5 to 10 percent higher than unit costs in traditional schools. The extra costs of providing special study guides, a library, and teachers with extra training — three times the amount of teacher training required for traditional classes — are offset by the fact that the schools have only one or two teachers for five grades.

Is *Escuela Nueva* replicable? People worry about this. It took more than 15 years for it to become a formal program, and the support it gets depends largely on the personal preferences of local administrators. Some also fear that expansion of this innovative program might lessen officials' control of the quality of its implementation, including the quality of teacher training, of delivery of materials, and of school follow-up.

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I. Introduction

Colombia, like many other developing countries, faces the dual challenge of improving the quality of education while increasing primary school coverage and retention in rural areas. In spite of the constitutional mandate of universal primary education, in the mid-1980s 50 percent of the rural schools in Colombia did not offer complete primary education, and 55 percent of rural children between the ages of 7 and 9, (26 percent between ages 10 and 14) had never attended school. Internal efficiency in rural primary schools^{1/} was less than 20 percent in 1983, while dropout in the first grade was around 35 percent in rural areas (see MOE, 1986).

Stemming from theories on multigrade teaching and automatic promotion, Unitary Schools (*Escuelas Unitarias*), pioneered by UNESCO^{2/}, were established in the early 1960s in isolated rural areas with low population densities. The main characteristics of the Unitary School are the presence of a single teacher (multigrade), automatic promotion, learning that enables children to advance at their own pace, educational materials that permit the teacher to work with several groups at once, and a teacher who guides students instead of lecturing *ex cathedra*.

By the mid-1960s, the program had expanded in Colombia to 150 pilot schools in one province. But when an effort was made to expand it to the national level a few years later, several problems became apparent (e.g., in teacher training, the application of the automatic promotion system, and the relationship of the course contents to the rural environment in which children lived). In response to these problems, *Escuela Nueva* was created in the mid-seventies as an official program of the Ministry of Education improving curricular, training, and administrative aspects of *Escuelas Unitarias*.

Since *Escuela Nueva*'s inception it has expanded rapidly. Beginning in 1976 with a few schools, by 1978 more than 500 schools were involved in the program with another 1500 schools

^{1/} As measured by the percentage of 1st grade students who complete the 5th grade in five years.

^{2/} Recommendation No. 52 of the International Conference of Ministries of Education. For a complete description of the history of the program see Colbert de Arboleda (1987).

added by 1982. With partial financing from the World Bank, *Escuela Nueva* was expanded again to several provinces covering several thousand rural schools, and by 1989 17,948 schools were operating at the national level serving 800,000 students. It is expected that over the next few years the *Escuela Nueva* program will be expanded to include all rural schools in the country (nearly 41,000), with the objective of raising the percentage of rural children completing the basic cycle from 20% in 1984 to about 60%.

What is *Escuela Nueva*?

Escuela Nueva is a rural school with one or two teachers offering all five years of the primary education cycle.^{3/} It differs from traditional primary schools in the following ways:

- *Escuela Nueva* is multigrade, i.e. one or two teachers instruct children of different grades, all working in one or two classrooms.
- *Escuela Nueva* features flexible, although not automatic, promotion. The student is promoted to the next level once s/he accomplishes the minimum educational objectives, which could take more than one academic year. This promotion system altered the automatic promotion scheme of the Unitary School.
- *Escuela Nueva* features special instructional materials such as student and teacher guides. The curriculum component consists of guides for students and manuals for teachers and supervisors. The student guides^{4/} facilitate individual as well as group work. These guides are complementary to textbooks and are designed according to the approved national curriculum.

^{3/} For a comprehensive description of *Escuela Nueva* see Schiefelbein (1991).

^{4/} Guides describe the objectives to be accomplished and the basic information and practical activities to reach them. They direct students in regard to the activities that must be followed. Students share a set of guides distributed by the Government at no cost to the students.

- The *Escuela Nueva* curriculum is rural-oriented. The guides, developed by the teachers themselves during training sessions, help the teacher to adapt the national curriculum to regional and local needs, and encourage the practical application of what is learned in the school to community life.
- *Escuela Nueva* requires specially trained teachers in two areas (i) subject matter and (ii) the application of the different educational materials of the program. The training and follow-up components designed for teachers and administrators are conducted through a series of three workshops during which teachers learn how to involve the community and use the new educational materials, student guides, and the school library. The training, as well as the design of materials, is done sequentially so that teachers can gradually apply what they learn. Training becomes an active learning process about how to implement the program.
- *Escuela Nueva* supports mastery learning, where older students coach younger ones (peer instruction).
- *Escuela Nueva* schools have study corners and a small library. Study corners are established areas for activities focussing on different topics of learning, such as science, math, and social studies. The library provides support not only for students, but is also designed to be an information center for the community at large.
- *Escuela Nueva* attempts to integrate the student, schools and the community by encouraging teachers, students, and parents to participate in school activities. Examples of such activities include a school surroundings map, family records, a county monograph and agricultural calendar. The objective is to actively involve parents in support of their children's learning.

- *Escuela Nueva* receives frequent supervisory visits, which are part of an effort to streamline the administration of the program at the regional level, including technical assistance and orientation from supervisors.
- The program also includes the organization of a student government, one of the most innovative elements of *Escuela Nueva*. Students, teachers and parents are encouraged to actively participate in school activities, including its direction and organization.
- A self-monitoring mechanism allows students to monitor their own attendance record and communicate to the teacher their concerns and problems through a suggestion box. Teachers control students' progress using a progress control book; once a student finishes an activity, s/he has to show it to the teacher for evaluation and authorization to begin a new activity. With this book teachers control students' achievement in each learning module, which is part of the flexible promotion concept mentioned above.
- *Escuela Nueva* features a demonstration school in each educational district, as an example of how a successful school should work.

A traditional school is of course one that follows a national curriculum, does not provide special attention to slow learners, and does not stimulate the student by special materials.

II. The Sample

In 1987, after some years of implementation, an evaluation of *Escuela Nueva* was conducted by the Ministry of Education to determine the cognitive achievement of third and fifth grade students in mathematics and Spanish, as well as self-esteem, creativity and civic behavior. The raw data used in this paper come from that study (see Rojas and Castillo, 1988). A quasi-experimental design was used to compare *Escuela Nueva* with traditional schools in rural areas of 12 regions that had experience with *Escuela Nueva*. *Escuela Nueva* schools were selected randomly, taking into account the length and depth of school participation in the *Escuela Nueva* program (at least five years, and complete implementation of *Escuela Nueva* components). Traditional schools were selected in the same districts where an *Escuela Nueva* school was part of the sample. The sample is free of selectivity bias, in the sense that *Escuela Nueva* is offered only in certain areas of the country and students living there do not really have a choice on whether to attend that school or another.

In all, 168 *Escuela Nueva* and 60 traditional schools were visited and 3,033 students were sampled. Cognitive achievement tests in Spanish and mathematics were administered to 1,702 third graders and 1,331 fifth graders (see Table 1). This was complemented by the application of a set of tests on self-esteem, creativity, and civics (democratic behavior), aspects that are suppose to be positively affected by *Escuela Nueva*. In addition, questionnaires were used to generate information on the characteristics of students, teachers and schools.

Table 1. Student Distribution by School, Type and Grade

Grade	Traditional	<i>Escuela Nueva</i>	Total
Three	687	1,015	1,702
Five	582	749	1,331
N	1,269	1,764	3,033

Table 2 presents summary statistics of the key variables used in the analysis. Students in both types of schools were somewhat older than would be expected in theory (10 and 12 years old for third and fifth grade, respectively), reflecting delay at entrance or repetition experience, phenomena that are particularly observed in rural areas in the country. In fact, one half of the students in our sample had experienced repetition, particularly those in traditional schools, and nearly 40 percent had attended more than one school. The rural nature of the sample is evident from the relatively large family size, about 7.5 members, found for all types of students. (The national average, according to the last population census in 1985 is closer to 5 family members). The sample was fairly divided between males and females in both types of schools and grades. One in three students had worked for a salary, regardless of the type of school or the grade level.

More families with students in traditional schools were living in poor regions in the country. Regarding other family characteristics, no differences were observed in terms of presence of books, radio and/or TV set at home. In terms of school characteristics, *Escuela Nueva* had better indicators of supervision visits and student-teacher ratios, although they had less access to electricity.

Regarding teachers' characteristics, traditional schools had older and more experienced teachers, with higher pay, although less formal education and university education experience. Traditional schools, when compared to *Escuela Nueva* schools, were more likely to have female teachers, and teachers living outside of the school. A large majority of teachers in both types of schools and grades had studied the pedagogical track during secondary as well as higher education.

Table 2. Variable Means by School Type and Grade

Variable ^{1/}	Entire Sample	School Type		Grade	
		Nueva	Traditional	Three	Five
<u>Student Characteristics</u>					
AGE	11.42	11.47	11.36	10.61	12.57
MALE	.52	.52	.53	.52	.53
WORKS	.37	.36	.38	.38	.36
REPEATER	.52	.49	.55	.52	.50
FDROPOUT	.11	.10	.12	.06	.17
OTHERSC	.37	.38	.35	.35	.39
TVHOURS	1.46	1.38	1.58	1.52	1.39
<u>Family Characteristics</u>					
POOR	.26	.22	.32	.29	.21
HHSIZE	7.45	7.48	7.41	7.48	7.42
BOOKS	.78	.78	.78	.80	.75
TV	.48	.45	.51	.46	.49
RADIO	.86	.87	.84	.88	.83
<u>School Characteristics</u>					
NUEVA	.58	1.00	.00	.60	.56
STRATIO	26.00	25.81	26.28	25.80	26.30
LUZ	.79	.77	.82	.76	.83
SUPERV	3.35	3.81	2.73	3.02	3.78
<u>Teacher Characteristics</u>					
FEMT	.75	.74	.75	.75	.74
AGET	34.83	33.15	37.25	35.00	33.59
ST	11.81	11.84	11.78	11.75	11.90
NORMAL	.74	.73	.77	.79	.68
UNIVED	.12	.12	.13	.15	.10
EXPT	13.70	12.23	15.74	13.85	13.51
EXPTNUEV	3.58	5.47	.95	3.02	4.29
EXPTSC	8.73	8.04	9.69	8.33	9.25
TINHOUSE	.26	.33	.17	.27	.25
TPAY	4.73	4.34	5.28	4.61	4.61

^{1/} See Annex for exact variable definitions.

III. Explaining Achievement

Mean achievement scores by school type and grade are presented in Table 3^{5/}. To facilitate comparisons of students in different schools, the tests were standardized to a mean of 50 and a standard deviation of 10^{6/}. The mean scores of the cognitive tests revealed that *Escuela Nueva* students scored higher than traditional school students, except in the math test among fifth graders^{7/}. Regarding the non-cognitive tests,^{8/} the mean scores again were higher for *Escuela Nueva* students, especially among third graders. In the analysis we also included as an outcome variable the fact that a student declared s/he would leave school at the end of the school year. As expected, among fifth graders the propensity to dropout was higher. While the propensity for dropout was lower for *Escuela Nueva* students at the fifth grade, it was higher for *Escuela Nueva* students at the third grade.

It seems that in many rural and marginal urban areas stiff promotion policies discourage students and parents. According to many observers, the combination of textbooks and learning guides helps the student to orient her/his own work and frees the teacher to help more disadvantaged students. Another beneficial outcome is that *Escuela Nueva* has increased

5/ Several instruments were designed to measure achievement, specific for each grade. The Spanish tests included open questions for reading comprehension, writing skills and basic grammar according to the national curriculum. The reliability for each test was 0.82 and 0.86, respectively. The math tests included 20 items for each grade level. The reliability for the third grade test was 0.84 and the one for the fifth grade test was 0.80.

6/ The formula for standardization was $T=[10(X_i-\bar{X})/S_x]+50$.

7/ In spite of the positive findings of *Escuela Nueva* students, their scores indicate that they only achieve near one third of the intended curricular objectives in the case of math for both third and fifth grades, and a little more than half the curricular objectives in Spanish for both grades.

8/ A different instrument was developed for each of the non-cognitive tests. For creativity a three items questionnaire was designed to determine flexibility, fluidity and originality. Self-esteem was determined with 26 items using a Likert scale, and civic behavior was determined with 14 multiple choice questions. The reliability coefficients for these instruments were 0.76, 0.84 and 0.71, respectively.

community participation in educational activities and has fostered democratic values through the School Government mechanism. It is encouraging that *Escuela Nueva* makes learning not only a personal but a communal endeavor. Finally, according to these observers, the continuing training teachers have received through this approach has been quite beneficial to enhancing learning.

Differences in gross means, of course, can hide the effect of individual factors on student achievement, beyond the fact that a student attended an *Escuela Nueva* or traditional school. To be able to draw conclusions about *Escuela Nueva's* effectiveness in improving academic performance one has to control for these other factors. For this purpose, a standard educational production function was fitted to explain student achievement across schools. The functions were fitted within grade 3 and 5 students for those who took the corresponding Spanish and Mathematics test, and for these who answered the creativity, self-esteem and civic instruments regardless of grade level.

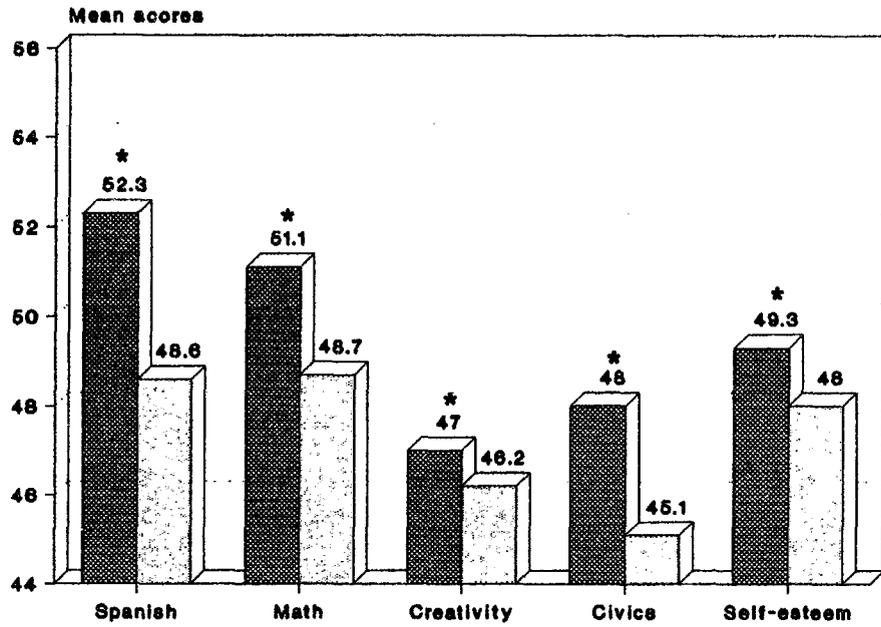
Achievement = f(school type, student background, school factors, teachers' characteristics)

Table 3. Mean Scores by Grade and School Type

Outcome	Grade			
	Three		Five	
	Nueva	Traditional	Nueva	Traditional
ZSCORE(SPAN3)	52.3	48.6	n.a.	n.a.
ZSCORE(MATH3)	51.1	48.7	n.a.	n.a.
ZSCORE(SPAN5)	n.a.	n.a.	50.5	49.4
ZSCORE(MATH5)	n.a.	n.a.	49.9	50.1
ZSCORE(CREATIVE)	47.0	46.2	54.6	54.8
ZSCORE(CIVIC)	48.0	45.1	54.0	53.8
ZSCORE(SELF-ESTEEM)	49.3	48.0	51.9	51.2
REPEATER (%)	50.6	55.2	47.1	54.5
FDRPOUT (%)	6.9	5.2	15.4	20.1

n.a. = Not applicable.

Grade 3



Grade 5

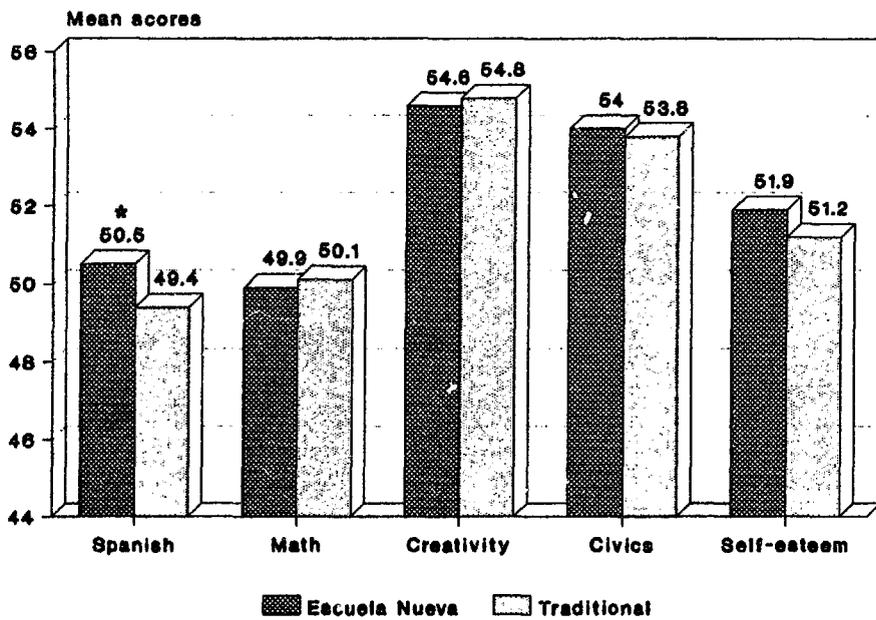


Figure 1. Mean Raw Scores by Grade in Escuela Nueva and Traditional Schools
* Statistically significant difference at $P \leq .05$

Table 4 presents the results of this multivariate analysis in order to control for the many factors that could simultaneously affect academic performance^{9/}. The results for third graders are shown in columns one and two, and for fifth graders in columns three and four. (*Escuela Nueva* is a 0 - 1 dummy variable, where zero is traditional schools). *Escuela Nueva* is positively related to achievement except in fifth grade mathematics.

Students' characteristics such as gender and being a repeater, had a significant impact on education outcomes. Male students did better than female students in mathematics but not in Spanish, where girls performed better. The effect of repetition on academic performance was negative. Other characteristics sometimes associated with academic performance, like work experience and hours of TV watching, did not have any significant effect (although TV watching negatively affected Spanish achievement in third grade).

Several family characteristics that are associated with academic performance in the literature proved to have the expected results. Students in families living in the poorest regions achieved significantly less; corroborating this, students in families that own a TV set -- an indicator of wealth in rural areas -- performed better, particularly in Spanish tests. Having books at home seemed to be relevant for third graders but not for fifth graders. Finally, getting help with homework at home did not have any significant effect on achievement.

The third set of variables refers to school characteristics, including type of school. It is clear that *Escuela Nueva* has had a significant effect on students' achievement in math and Spanish for third graders, and in Spanish for fifth graders. The student/teacher ratio had the expected negative impact among third graders, but not among fifth graders. Access to electricity, the indicator of school facilities we are using, had a positive impact on achievement. Finally, the number of visits from supervisors was negatively related to academic performance, pointing out the possibility that supervisors visit more schools with lower quality.

9/ For a summary of the literature on factors that affect achievement see Fuller (1990).

Table 4. Explaining Educational Output Scores within Grades

Independent Variables	Grade 3		Grade 5	
	Spanish	Math	Spanish	Math
<u>Student characteristics</u>				
Age	.256	.175	-.156	.005
Male	-.814	1.134**	-.569	1.264**
Works	.075	.232	.230	-.021
Repeater	-1.152*	-1.581*	-1.351*	-1.219**
Hours watching TV	-.264**	-.224	-.040	.003
<u>Family characteristics</u>				
Poor region	-1.811*	-.823	-1.584**	1.638**
N of books at home	1.448*	1.710*	-.260	.741
TV at home	1.105**	.157	1.433**	.469
Radio at home	1.193	.705	-.140	.001
Homework help	-.014	-.776	-.419	.968
<u>School characteristics</u>				
<i>Escuela Nueva</i>	3.712*	3.110*	1.947*	.541
Student-teacher ratio	-.111*	-.132*	.025	.004
Electricity access	2.074*	1.173	3.748*	1.705**
N of supervisory visits	-.035	-.070	-.139**	-.068
<u>Teacher characteristics</u>				
Female	-1.325**	-.673	-.329	-1.301
Years of experience	.083**	.086**	-.034	.180*
University graduate	2.570*	4.453*	2.100*	4.418*
Lives in school	2.171*	1.774*	2.369*	3.337*
Pay scale	.164	.209	.176	.070
Constant	44.688	45.738	48.740	43.483
R ²	.112	.102	.113	.081
N	1,485	1,480	1,021	1,025

* Statistical significance at the 1% level or better.

** Statistical significance at the 5% level.

The most relevant teachers' factor was his/her pre-service education. A university degree had a strong positive relation to all output scores. Teachers' experience was also positively associated to most cognitive outcomes. Being a female teacher did not seem to be helpful, particularly for Spanish in the third grade. Teachers' salary level (pay scale) did not have any effect. Another relevant factor was the place where the teacher lived; when the teacher lived in the school, a proxy of student-teacher interaction and time on task, the academic achievement of students was higher than when the teacher lived somewhere else.

The results for both grade levels were quite similar. The only relevant differences were found in books at home and student-teacher ratios. The fact that fifth grade student had books at home did not improve their academic performance. The other clear difference was that the student-teacher ratio negatively affected the performance of third graders but not fifth graders.

Table 5 presents the models dealing with the explanation of creativity, civic behavior and self-esteem. *Escuela Nueva* had only an independent effect on civic behavior. In column one, the results for creativity indicate that older students who had work experience and had not repeated any grade were more creative. Among the family factors, the only one with a positive effect on creativity was having TV at home. The negative impact observed for female teachers in explaining academic performance was also found in explaining creativity. Teachers' salary level, years of experience and living in the school were positively associated to creativity.

Civic behavior, the only non-cognitive achievement positively affected by *Escuela Nueva*, was also explained by students characteristics, i.e., age (older students were more civic), gender (male students were less civic), grade repetition (repeaters were less civic), work experience (workers were less civic) and hours watching TV (the more TV watched, the less civic). Among family characteristics, students from households in poor regions were less civic, while students who received help to do their homework and had a TV at home were more civic.

Table 5. Explaining Non-cognitive Scores

Independent Variables	Creativity	Civics	Self-esteem
<u>Student characteristics</u>			
Age	1.307*	1.337*	.899*
Male	.140	-1.426*	-.919**
Works	.829**	-.947**	.111
Repeater	-2.075*	-2.092*	-2.190*
Hours watching TV	-.264	-.438*	-.214
<u>Family characteristics</u>			
Poor region	-.438	-1.564*	.627
N of books at home	.580	.291	2.138*
TV at home	2.176*	2.431*	.522
Radio at home	.403	-.055	-.097
Homework help	-.518	1.019*	.038
<u>School characteristics</u>			
<i>Escuela Nueva</i>	.336	1.249*	.575
Student-teacher ratio	.007	.014	-.004
Electricity access	2.865*	1.446*	-1.599*
N of supervisory visits	.076**	-.006	-.086**
<u>Teacher characteristics</u>			
Female	-1.667*	.017	.677
Years of experience	.081*	-.015	-.063
Education University Graduate	.9821	.711*	-3.110*
Lives in school	3.144*	1.489*	1.209*
Pay scale	.610*	.013	.099
Constant	27.633	33.019	40.709
R ²	.163	.124	.067
N	2,519	2,330	2,372

* Statistical significance at the 1% level or better.

** Statistical significance at the 5% level.

Education university graduates and the fact that a teacher lived in the school were two relevant characteristics to explain civic behavior.

Self-esteem, in the last column, was weakly explained by the model. Males and repeaters had a negative self-esteem when compared to females and non-repeaters. Among the family characteristics, the availability of books at home was the only variable affecting, in a positive way, self-esteem. In regard to school characteristics, access to electricity and the number of supervision visits seemed to affect negatively the student's self-esteem. Teachers with university studies in education had a negative impact on self-esteem. When teachers lived in the school students tended to have a higher self-esteem level.

In Table 6 we present another indicator of school quality--the student self-reported predicted dropout probability. Because this is a 0-1 limited dependent variable, a logit model is fitted^{10/}. *Escuela Nueva* significantly decreased the dropout probability of fifth graders but not that of third graders. According to the results for third graders, age and gender were predictors of school dropout. Older and male students had a greater probability of exiting the education system. For fifth graders the results were somewhat different. As before, male students were more likely to dropout from school. Age, however, presented a different trend where every extra year of student's age decreased the probability of dropping out of school. For fifth graders, work experience was the most significant characteristic predicting dropout, which is to be expected in rural Colombia. Interestingly, living in a poor area and repetition experience did not have a significant effect in determining the self-reported dropout probability.

One may argue that in low populated areas, to have or not to have a multigrade school is not a choice. For this purpose we have rerun the above functions within the *Escuela Nueva* sub-sample in order to see what factors lead to higher achievement in this type of school. The results (not reported here in detail) show that a lower student-teacher ratio, the availability of

^{10/} The model reflects the probability of a student getting out of the school system the following year, as a function of selected characteristics.

electricity, a higher teachers' pay, university education of the teacher and the teacher living in the school, all contribute significantly to achievement gains.

Table 6. Predicted Dropout Probability by Grade

Independent Variables	LOGIT coefficients	
	Third Grade	Fifth Grade
Age	.139*	-.119**
Male	.546*	.330**
Works	.112	.912*
Repeater	-.320	.036
Poor region	.061	-.317
<i>Escuela Nueva</i>	.247	-.306**
-2 Log likelihood	776.014	991.307
N	1,698	1,202
Mean dependent variable	6.2	17.4

* Statistical significance at the 5% level or better.

** Statistical significance at the 10% level.

IV. Conclusions

In summary, our findings indicate that *Escuela Nueva* has had a significant independent effect on student outcomes, controlling for student and family characteristics, and school inputs.

Other indicators that corroborate the positive result of *Escuela Nueva* are found in Rojas and Castillo (1988), who observed that in spite of the fact that in 42% of the *Escuela Nueva* schools the student body government had not been organized, these schools had a significantly higher level of participation measured by activities such as adult education (35.6% versus 28.1%), agricultural extension (35% versus 15.8%), athletic competitions (54.6% versus 42.5%), health campaigns (82.9% versus 56.7%), and community celebrations (88.5% versus 83.3%).

An important point is that the above beneficial results were achieved at a unit cost per student which does not differ substantially from that of traditional schools. *Escuela Nueva* unit costs are estimated to be just 5% to 10 % higher than unit costs in traditional schools (Schiefelbein, 1991). The extra costs of providing students with study guides, library, and teachers with extra training are offset by the fact that *Escuela Nueva* schools have only one or two teachers, as opposed to the one-classroom one-teacher situation in traditional schools.

As a cautionary note, it is important to keep in mind that until a cost study is conducted the results of comparing *Escuela Nueva* and traditional schools should be considered as preliminary. As an example of the eventual implication of cost, although *Escuela Nueva* teacher training is focused on multigrade teaching (which may have cost savings implications), teacher training at the time of the study was calculated to be at least three times higher in *Escuela Nueva*. So in spite of the increments in achievement and improvement in dropout rates, the available information has to be cautiously used to preach the benefits of the program.

Another problem that *Escuela Nueva* faces is that of replicability. In spite of its achievements, it took more than 15 years for *Escuela Nueva* to become a formal program. Prior to 1982, it was dependent on more than three offices within the Ministry of Education. Today, even though *Escuela Nueva* has been institutionalized in the whole country, the support it receives in some of the provinces largely depends on the personal preferences of local administrators. The conservative character of the educational system in Colombia has been a difficult barrier to achieving current levels of implementation. The support received from local private organizations (National Federation of Coffee Growers, and others) has proved essential for program development and implementation at pilot and local scale, but for a massive implementation at the national level their role will be less relevant.

In spite of support from international agencies (AID, IDB, UNICEF and The World Bank continue to support *Escuela Nueva*), one wonders what will happen during the expansion of this innovative program. A major concern is that up to now (during the pilot phase and small scale operations period), highly motivated *Escuela Nueva* officials have been able to control the quality of its implementation, but with the current massive expansion it may be more difficult to maintain the quality of the program. It is important to follow the current expansion as this will be the real test of the processes related to teacher training, delivery of materials, and schools follow-up, that form the *Escuela Nueva* model.

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ANNEX

Independent Variables Used in the Analysis

Student Characteristics

AGE	In years
MALE	Dummy 1 = male, 0 = female
WORKS	Working-for-pay experience (1, 0 dummy)
REPEATER	Repetition experience in at least one grade (1, 0 dummy)
FDROPOUT	Self-reported dropout for next school year (1, 0 dummy)
OTHERSC	Study experience in other schools
TVHOURS	Numbers of hours of TV watching a day

Family Characteristics

POOR	Family living in a poor region (1, 0 dummy)
HHSIZE	Family size
BOOKS	Number of books at home
TV	Presence of TV at home (1, 0 dummy)
RADIO	Presence of radio at home (1, 0 dummy)

School Characteristics

NUEVA	<i>Escuela Nueva</i> student (1, 0 dummy)
STRATIO	Student-teacher ratio
LUZ	School has access to electricity (1, 0 dummy)
SUPERV	Number of supervision visits in last two years

Teacher Characteristics

FEMT	Female teacher (1, 0 dummy)
AGET	Age of teacher
ST	Number of formal years of teacher's education
NORMAL	Teacher studied education during secondary (1, 0 dummy)
UNIVED	Teacher graduated from an education university faculty (1, 0 dummy)
EXPT	Number of years of teacher's experience
EXPTNUEV	Number of years of teacher's experience in <i>Escuela Nueva</i>
EXPTSC	Number of years teaching in current school
TINHOUSE	Teacher lives in school (1, 0 dummy)
TPAY	Teacher's pay scale (Escalafón)

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