

Institute for International Research

1815 North Fort Myer Drive #600

Arlington, VA 22209 USA

Telephone: (703) 527-5546

Fax: (703) 527-4661

In collaboration with Juárez and Associates, Inc. and the University of Pittsburgh

RESEARCH REPORT
PHASE I

DRAFT

*IMPROVING EDUCATIONAL QUALITY
PROJECT
- GUATEMALA -*

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Prepared by Dr. Yetilú de Baessa and the IEQ Guatemala Team

IEQ GUATEMALA: PHASE I

STUDY OF THE *NUEVA ESCUELA UNITARIA* PILOT PROGRAM

EXECUTIVE SUMMARY

Introduction

In Guatemala, IEQ is working with the Ministry of Education (MINEDUC) to study the implementation and impact of *Nueva Escuela Unitaria (NEU)*. The NEU program is designed for multigrade schools in rural areas of Guatemala. It is based on active learning principles that stress collaborative learning, peer teaching, use of self-instructional guides and the like. During the 1993 school year, which corresponded to the first full year of the development of the program, testing and classroom observations of first and second grade children were carried out at 10 experimental schools and 10 comparison schools. These schools formed a 10% sample of the pilot program that is being implemented in two regions, one with a predominantly indigenous population and the other with a non-indigenous or *Ladino* population. The remainder of this document summarizes the study design, the findings of the study, and implications based on the findings.

Design

The design was a pre-post study for second graders and a post-test only study for first graders. Experimental children attended schools implementing the *Nueva Escuela Unitaria* program in one of two regions of Guatemala. Comparison children attended traditional multigrade schools with similar characteristics. Children were tested on a battery of tests including reading, mathematics, creativity, and self-concept. Spanish language proficiency was also assessed in the region with a predominately indigenous population. In addition, a subsample of experimental and comparison children at each of the study schools were the subjects of intensive classroom observation for two, month-long periods during the school year. Twice during the school year, parents and teachers responded to questions related to their satisfaction with the curriculum being implemented in their schools. Two-tailed t-tests were used to assess difference in the test performance of experimental and comparison children. Contrasts were also made by gender and language. Observational data were coded

by the nature of the interaction engaged in by the target child and these interaction codes were summarized and correlated with the children's academic performance on the tests.

Major Findings

Children

Overall, higher academic achievement was found in the experimental schools carrying out the NEU program as it had been designed. However, in schools where the program had not been effectively implemented, children performed no differently on test results or differences favoring children in traditional schools were found.

In Region II, where the NEU program was fairly well implemented in four of the five experimental schools, the significant differences in test scores favored the NEU children on eleven of twelve comparisons where significant differences were found. These results were consistent for both schools in Alta Verapaz, a Mayan-speaking area and Baja Verapaz, a Spanish-speaking area.

In Region IV, however, the NEU program was well implemented in only two of the five experimental schools. In that region, there was little difference in academic achievement as only one of the four significant differences found between experimental and comparison children favored NEU.

Participation in small group activities was significantly related to academic achievement in experimental schools.

In both regions, significant correlations were found between participation in small groups and most measures of academic achievement. Where the program was well implemented, observations showed that a classroom environment that allowed students to engage in an assortment of participation contexts (e.g. small groups with teacher, small group without teacher, small groups with an appointed or elected student leader, dyads) was created. These successful NEU classrooms were observed to have decentralized and diversified discourse and interaction patterns to bring about greater cooperation and more meaningful involvement of individual children in instructional activities.

Where the NEU program is well implemented, it can contribute to increasing cross-sex interactions and to girls' achievement. However, where not implemented effectively, the program may not contribute to girls' achievement.

In Region II, eight of the nine significant differences found on the tests favored NEU girls. In Region IV, three of four significant differences favored girls in the comparison schools.

One of the hypotheses about an active, decentralized learning program, such as that of the NEU, is that it will allow children of different sexes greater access to each other and thereby help to break down traditional stereotypes. The relative frequencies of interactions

with same and opposite sex peers were calculated to investigate this contention. In Region II, girls in both first and second grade at each NEU school interacted with boys with greater frequency than girls in the corresponding comparison schools. In addition, girls in each NEU school interacted with boys with greater frequency than girls in all but one comparison school. This trend was not found in Region IV, however, where girls in both types of schools had similar interaction patterns.

Use of both Mayan and Spanish by children whose dominant language is Mayan is significantly related to achievement in NEU schools.

At the time of the pre-test, Mayan children participating in the NEU program were significantly less proficient in Spanish than the comparison children. However, by the post-test, NEU children performed as well as the comparison children on all Spanish reading measures.

Despite similar overall patterns of language use, the relationship of language use to academic performance differed greatly in NEU and comparison schools. The use of Spanish was significantly correlated with vocabulary, comprehension, overall reading and mathematics at the first grade level in NEU schools. Spanish comprehension was also correlated with the use of Q'eqchi', suggesting that the opportunity given by NEU to construct knowledge in the native language aids children in understanding the content presented in a second language, at early levels of second language acquisition. No significant relationships were found between language use and achievement among first graders in comparison schools.

Both malnourished and well-nourished children participating in NEU had higher academic achievement than comparison children in schools where the program was well implemented.

The relationship between nutrition level and academic achievement differs in the two regions studied. Region II malnourished children and relatively well nourished children in NEU consistently performed better on achievement measures than comparison children. This was not the case in Region IV.

The relationship between nutrition level and achievement in the NEU schools has as a mediating factor the context and the type of interaction that this new methodology provides. Where the teacher was observed to implement an active teaching style, the pupils with a low level of nutrition were compelled to participate in the classroom activities in spite of their low activity level and natural tendency toward isolation. This was not observed to occur where the NEU program was less well implemented nor in traditional schools.

Parents

Parents generally had highly favorable perceptions of the NEU program.

The NEU program already seems to have had an impact at the community level, since it was found that by the end of the school year the parents of NEU children perceived that there was a favorable change in the school in a significantly greater proportion than in the traditional schools. Furthermore, in the NEU schools the percentage of drop-outs was significantly lower when contrasted with the comparison schools.

These two findings are yet more relevant if it is considered that the parents of the NEU schools have an average education significantly lower than that of the parents in the comparison schools.

Implications

Carrying out strategies that allow children to interact with teachers and peers to construct meaning is essential to increased academic achievement.

Children in well implemented NEU classrooms were observed to generate knowledge with the assistance of their teachers in a decentralized manner. Children in these schools worked with teachers, peers, and materials to find answers. In less successful schools, the teacher usually initiated and evaluated the discourse related to knowledge acquisition. Thus, students were required to perform in ways that meet the expectation of the teachers. Students internalized knowledge through memorization but were not authorized to discover knowledge without tutorial direction, as occurred in well implemented NEU schools.

The decentralized constructivist approach of NEU has potential for aiding second language acquisition in rural schools serving indigenous populations.

Young children were observed to use both languages to further their comprehension of subject matter in the NEU schools. The freedom to work with and alter the content and context of classroom discourse appears to aid in acquisition of both vocabulary and comprehension in a second language.

In a large-scale pilot project, a single year of implementation is not sufficient to see changes in academic achievement at all schools.

Although all schools had the physical setting and materials of a NEU program, not all were observed to have mastered the instructional strategies suggested by the program. Although students were organized in small groups in less successful NEU schools, their tasks were often those of drill and memorization common to the traditional multigrade schools. Greater success had been achieved in one region of the pilot project than in the other, but both had schools that were not yet effectively implementing the decentralized instructional strategies called for by the program at the end of the first year of implementation.

**IMPROVING EDUCATIONAL QUALITY
PROJECT**

RESEARCH REPORT

YEAR TWO

-GUATEMALA-

Prepared for:
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Prepared by:
Dr. Yetilú de Baessa,
Rosa Y. Girón,
Tanya Ramos and
Jorge Valdés

EXECUTIVE SUMMARY

During 1994, which was the second year of full implementation of the Nueva Escuela Unitaria (NEU) program, an active, child-centered learning program, for rural Guatemalan children. The Improving Educational Quality (IEQ) project carried out classroom observations, interviews with parents, and achievement testing in 10 NEU schools and 10 comparison schools. As the research is longitudinal in nature, the tests were administered to the same children as in 1993 and observations were also carried out on those children. As the sample had been in first and second grade in the 1993, the majority of them were in second and third grades in 1994.

DESIGN

The study design was a pre-post test, in both second and third grades. Also, children attending first and second grades in 1993 were compared with those in these grades in 1994. Children in the experimental schools attend the NEU program in two rural regions of the country. The comparison schools follow a traditional program but have characteristics similar to those of the experimental schools, such as distance from an urban center and number of students.

The children were tested on a battery of instruments consisting of reading, mathematics, self-esteem, and creativity measures. The subsample of children chosen the previous year were again observed, and children from the original subsample who were no longer in the schools were replaced at random with children with the same characteristics. These children were observed at three points during the school year for one hour in academic subjects so that each had been observed for a total of three hours during the year.

In addition, parents and teachers were interviewed about issues of interest to the NEU program implementors, especially about the transfer of learning from the school environment to daily life.

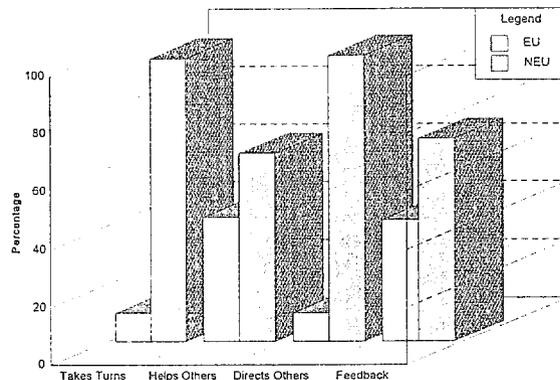
Several statistical techniques were used to analyze the data, such as two-tailed t-tests, analysis of covariance and chi square, depending on the type of data to be analyzed in each case. In the same way as in 1993, the data were analyzed by region, by gender, and by language. The observations were coded using the codes developed in 1993, and the interaction codes were summarized and used to complete the data analysis.

PRINCIPAL FINDINGS

The greatest impact of the NEU program in its second year of complete implementation was on the socio-emotional behavior of the children participating in the program.

The children who attended the NEU schools in all grades performed significantly better than students in the comparison schools on the creativity measure. The children participating in the NEU program cooperated with their peers, provided guidance to other students, and participated in school government with significantly greater frequency than their counterparts in traditional schools. Figure 1 compares the relative frequencies of observed participatory behaviors for the NEU and comparison samples as a whole.

Figure 1: Indicators of Participative Behaviors in the Total Sample



The changes in behavior found to be promoted by the NEU program in the classroom were transferred to the home and community life.

Parents of children who participated in the Nueva Escuela Unitaria program identified a willingness to talk to adults and to ask questions about their reality as changes that had taken place in their children as a result of attending school, with significantly greater frequency than did parents of children in comparison schools. Teachers, when asked generally about changes in their students, also identified a greater willingness to talk, to ask questions, and to interact with peers with consistently higher frequency than did the teachers in comparison schools.

The changes in socio-emotional behavior appear to be the result of the differences in the teaching strategies used by the NEU program and in the quality of the interactions that take place in the classroom.

Across all of the sample schools, the NEU program used a greater variety of learning contexts that did traditional schools. Students spent a significant part of the day in small group activities, working in pairs, using the learning corners or in other activities of this type. The students in traditional schools spent most of their day working on individual assignments at their seats or receiving dictation from the teacher

in a large group. When interacting with teachers, materials or peers, the NEU students were encouraged to expand responses, use their imaginations, and ask questions with greater frequency than children in traditional schools. There follows an episode taken from an observer's fieldnotes which illustrates these types of experiences in NEU schools.

Norma is a fourth grade student in a NEU school in the region of Baja Verapaz where the predominate language is Spanish. She is seated near two other students working on a story that the teacher had asked the children to create about a "corn stalk". The teacher at this moment is occupied with another grade.

Norma is copying the story that she invented about the corn stalk on a clean piece of paper. She looks at her notebook and writes "Once upon a time there was a corn stalk named Maria." She looks again at her notebook and says "and she had a daughter that she named Rosario, and Maria loved her a lot." She then continues to write on the sheet of paper, then reads " She told her daughter that she was a corn cob and that scared the girl very much, her father came home and the girl ran to him and hugged him." Norma finishes writing her story and says "Miss, I finished." The teacher tells her "Put your name on it and take it to the language corner." Norma writes her name and takes her story to the language corner.

This is a good example a learning experience in which the NEU teacher provides an opportunity for the children to use their imaginations. She allows the girl to create a story based in a topic which the teacher gave, but which uses familiar elements of the local environment in it's development. The teacher shows that the girl's efforts are valued, as she doesn't correct the story but accepts it as it is and asks that Norma take it to a learning corner where it becomes a permanent part of the curriculum and a resource for other children.

The NEU program has had a significant effect on retaining children in school.

In the two years of research, the NEU schools have had desertion rates significantly lower than those of the comparison schools. This is true for both boys and girls. The results also suggest that the NEU program may be encouraging children who dropped out to return to school, as increases in the relative enrollment were consistently higher in NEU when compared to the traditional schools.

The changes in socio-emotional behavior and in the classroom environment found in the NEU program have not translated into consistently higher gains in achievement.

The trends in achievement gains that generally favored the NEU children after one year of participation in the program, were less clear after two years of schooling.

The results were mixed, without a clear tendency favoring the children of either experimental or comparison schools in contrasts using the entire sample, or comparing by gender, language, or nutritional level. The lack of differences in achievement appears to be related to the inability of second and third graders in NEU to use the self-instructional guides effectively in small groups without the teacher present. Their limited reading ability forces them to use learning strategies such as asking directions from the teacher, and copying material which are similar to the strategies employed by children in traditional schools, rather than following the instructions in the guides.

The NEU program is having an effect on the performance of girls.

Girls who attended the NEU schools had significantly higher scores on the creativity measure than did girls in the comparison schools. The performance of girls on this measure is primarily responsible for the significant differences in creativity favoring NEU found for the total sample. As previously mentioned, the desertion rate among girls was significantly lower in NEU than in the comparison group during both years of the research. The observational findings also show that the NEU program is encouraging cooperation among indigenous children of both sexes.

IMPLICATIONS

A decentralized socio-constructivist approach appears to effect the socio-emotional behavior of young children sooner than it effects their academic performance.

It was observed that children in the NEU program employed strategies of elaboration, investigation, and cooperation that are generally associated with flexible learning aimed at problem solving. These strategies, however, have not produced increased learning, as measured on achievement tests, when compared to the strategies of memorization and repetition utilized by children in traditional schools. This is, in part, a result of the reading level reached by the children that did not permit them to use the NEU self-instructional guides effectively. The successful use of active learning strategies may depend on the ability of the teachers to provide children with consistent opportunities to use such strategies and this may require more than two years experience working with the NEU model.

With children in the early grades, the teachers should carefully assess children's reading ability before assigning them the self-instructional guides to use on their own.

The observed difficulty among NEU children to use the self-instructional guides successfully, owing to their limited reading comprehension, suggests that the teachers

should carefully evaluate the reading ability of each student if they expect the students to work successfully by themselves with the guides. Instruments of continuous evaluation that are simple for the teachers to use should be developed in order that the teachers can determine the ability of their students to successfully use the instructional materials for each grade level.

Parents should be encouraged to assist their children to further develop the learning strategies that they are employing in the classroom.

The use of cognitive strategies developed in the classroom in the context of the home suggests that parents can play an important role in the transference of strategies learned in school to learning situations in daily life. Teachers can invite parents to the classroom where they can serve as a learning resource for their children and can work with parents so that they can also become facilitators for their children's learning outside of the school context.