AILEM Programme: a long-term intervention to promote literacy learning in low-performing primary schools in Chile

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After one year of implementation, this paper describes a programme designed to support literacy learning in low performing schools from poor sectors in Santiago, Chile. School-based intensive training on theory and practice of a literacy learning framework for classroom instruction and long-term support were used to impact the achievement of students from disadvantaged families in 16 kindergarten classrooms and 16 1st-grade classrooms in nine primary schools. Preliminary results showed an improvement in learning achievement positively related to level of implementation of the literacy instruction framework in the classrooms and teachers' perception of an improvement in their knowledge and classroom practices. Although findings from this study cannot support definite conclusions, because of the lack of experimental conditions, they provide relevant information for future experimental studies on how to meet the literacy learning needs of children from disadvantaged backgrounds.

Keywords: Literacy; Teaching; Reading; Writing; School reform

Introduction

Reading and writing in the first few years of schooling is recognised as the major task children need to accomplish, because of its association with cognitive development, later reading skills and school learning in general. It has been found that children who lag behind in their reading skills receive less practice in reading, miss opportunities to develop reading comprehension strategies and acquire less knowledge in the different academic areas (Whitehurst & Lonigan, 2002). It has also been found that individual differences in 1st-grade reading achievement

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significantly predict later reading comprehension, there being a high probability that children who are poor beginning readers will continue to have a relatively weak performance through the upper elementary grades (Compton, 2000; Bravo *et al.*, 2003). It has also been established that disadvantaged populations, being educated in inner-city and rural schools with limited resources to allocate to education, have difficulty attaining functional literacy. On average, children from lower-income families enter school with less developed cognitive and academic abilities and tend to fall further behind in their learning achievements (Eyzaguirre & Le Foulon, 2002; Scarborough, 2002).

Education has been placed at the top of the Chilean government's priorities, as a means through which the less advantaged population will be better prepared to participate productively in a society with increasing demands of knowledge and skills. Since 1990, the slogan of the Chilean governments has been 'Growth with equity', a phrase that represents their interest in targeting the poorest sector in society and the positive discrimination policies. Even though more than 90% of the population's children are enrolled in primary education, it has been recognised that the poorest sectors are to be found in municipal and subsidised schools where resources are limited and learning outcomes are the lowest. Results from the national standardised test SIMCE (*System for measuring the quality of education*) in language and mathematics, applied in primary to 4th and 8th grades, evidenced that private schools, which account for 10% of primary-aged children, performed significantly better than the private subsidised and the public schools, funded by the government. On the contrary, the public sector, which accounts for 60% of primary schools, exhibited the lowest learning average outcomes. The Ministry of Education increased the resources allocated for the improvement of teaching and learning in the municipal and subsidised schools. Different innovative programmes directed towards the poorest achieving municipal and subsidised primary schools were implemented, within a general reform of the educational system that included the creation of a new National Curriculum, in order to improve learning standards for all pupils, including pre-school and elementary education. Improvements in the quality of school buildings, additional teaching resources and workshops for pre-school and elementary teachers were developed to promote more effective pedagogies. Assessing literacy and mathematics learning outcomes through national and international surveys has also been a relevant component of this educational reform (Barnard, 2000; Eyzaguirre & Le Foulon, 2002).

However, despite a decade of positive discrimination reform, recent results from these studies have evidenced no significant changes in learning outcomes. Many schools participating in the innovative programmes developed in the 1990s have maintained their previous underachievement in literacy and mathematics and national standards appeared significantly below those of the European and Asian students assessed. Some 32% of the 4th-grade students assessed in 2000 by the SIMCE did not reach the minimum level in mathematics, and 19% were below the minimum literacy skills. The lowest outcomes were found in the public schools. A large-scale longitudinal study funded by the Chilean Ministry of Education

(Ministerio de Educación de Chile, 1998) showed that between 36% and 49% of the 5749 children assessed at 4–5 years of age, lacked basic cognitive skills; 40% of this group did not show any progress by the end of pre-school level and 1st grade. At the end of 1st-grade, 50–59% of the whole sample had achieved less than 50% of reading, writing and mathematics learning objectives. Some characteristics of the educational process observed in the classroom were related to these results: only 25% of the time was devoted explicitly to educational activities, with appropriate materials, supervision and assessment. According to another study that assessed the quality of the different types of Chilean pre-school programmes against international standards, pre-school education is on average at a minimal level of quality, with 21% of the centres in the inadequate range. Personal care routines was the best area in all centres, followed by fine and motor development activities (Villalón *et al.*, 2002). In another recent study, focused on classroom practices at 1st and 2nd grades, it was established that more than 50% of the educational activities were devoted to learning the alphabet code in 1st grade and that there was very little emphasis on oral language and reading activities at both levels. According to a recent follow-up (Bravo *et al.*, 2003), only 25% of the students from the public schools serving children from middle- to low-income families in Santiago, Chile, exhibited the knowledge and skills needed to benefit from the learning experiences provided in primary education. Other studies confirm that many classrooms serving low-income children still do not that provide optimal support for their language and literacy learning (Burchinal *et al.*, 2000).

As a way to face a challenge that proved to be more complex and difficult than originally supposed, the Ministry of Education invited a number of institutions to design educational interventions to enhance the teaching performance in the schools with the lowest learning outcomes in the metropolitan area, where almost 40% of the country's population lives. The best proposals were selected and the costs of the interventions were financed by the ministry. All these schools enrol students from low-income families and are poorly equipped in terms of the quality of school buildings and teaching resources, despite the additional support received from the government. The main objective was to amend the underachievement in literacy and mathematics of these schools, through a four-year intervention programme from kindergarten to 4th grade. It was recognised that the reform programmes implemented did not change the teaching practices and that closer tuition and follow-up of the teachers were needed. These training programmes have been described as too much based upon theoretical aspects of teaching and too little based on practice (Filp, 1994). Different evaluation reports showed that SIMCE results were not used as a feedback to inform teaching and that assessment practices in the schools had to be improved, in order to support evidence-based teaching (Eyzaguirre & Le Foulon, 2002).

Selected among those supporting institutions, an interdisciplinary team from the Faculty of Education of the Pontificia Universidad Católica de Chile took charge of 14 out of 66 elementary schools, where learning achievements at 4th grade were significantly below average in the national testing. The intervention programme was

designed and implemented in collaboration with the Foundation for Comprehensive Early Literacy Learning (CELL).

Academic contacts between CELL and the Faculty of Education had been developed during the last years. Members of the faculty had known about CELL's experience in the USA with educational interventions, including social groups and learning problems, not too distant from those found in Chile and had wondered about the possibility of implementing similar strategies in the country. The call done by the Ministry was seen as an opportunity to do it. Therefore, an institutional collaboration with CELL, including the mobility of experts and educational trainers was included in the proposal submitted to the Ministry. CELL was initiated in 1994 as a project of the California State University, to support literacy learning in primary grades for schools in Southern California, where a significant proportion of the population is from poor Hispanic backgrounds. During the past ten years, CELL has trained more than 12,000 teachers who have, in turn, provided instruction for more than a million students. Many of these teachers are from Hispanic backgrounds, serving at bilingual schools where the children of immigrants receive their education. A large-scale study conducted by the Program Evaluation and Research Branch of the Los Angeles Unified School District (2000) concluded CELL was effective regarding overall increases in achievement, as well as compared to results from schools that received no training. The impact on special education was also measured, from savings that result in the reduced referral of children. Both level of implementation and adherence to the instructional framework were seen as important variables. Thus, CELL's experience with Hispanic and poor students, using strategies which could be applied to different educational programmes and not asking for specific classroom materials, were considered among the advantages that CELL presented to contribute to our intervention. The fact of beginning those strategies at pre-school and integrating that level to the primary level, was also considered of importance, in order to improve children's early literacy experience.

After one year of implementation, this paper presents the strategic principles and theoretical background of the proposed programme, description of the participants, the training processes and some preliminary results, together with the impact of the intervention on the children's learning achievements, and the teachers' perception of the training effects in their theoretical constructs of literacy learning and effective classroom instruction. Results from this study support no definite conclusions, because of lack of experimental conditions, but do provide relevant information for future research on how effective literacy learning of children from disadvantaged backgrounds might be supported.

The AILEM programme: key principles and theoretical background

The programme Aprendizaje Inicial de la Lectura, la Escritura y las Matemáticas [Early Learning in Reading, Writing and Mathematics] (AILEM), was developed applying CELL key principles within the framework of the Chilean National Curriculum, including its contents and pedagogical resources, to improve classroom

instruction and increase learning achievements. The key principles of effective professional development, described in detail below, have been found essential for the improvement of teaching practices (OECD, 1992; Hopkins & Stern, 1996; Marchesi & Martín, 1998).

Emphasis on reading and writing

Research in the past two decades has significantly increased our understanding of how children learn to read and write and the type of instruction that provides the necessary support for children in the learning process (Adams, 1990; Clay, 1991a; Teale, 1995; Jiménez & Ortiz, 1995; Solé & Teberosky, 2001; Neuman & Dickinson, 2002). Literacy acquisition is a complex task involving the development of oral language and the mastery of written language, both reading and writing. It is increasingly apparent that pre-school experiences are crucial to children's long-term literacy success. Recent evidence suggests that most reading difficulties are caused by limitations in children's early literacy experiences and educational context before formal literacy instruction (Scarborough, 2002; Vellutino & Scanlon, 2002). Studies focusing on emergent literacy have demonstrated that, as part of their early socialization and prior to formal literacy instruction, children from advantaged backgrounds develop an understanding of the phonological units that make up a language, a knowledge of the graphic representations of sounds and the formats of texts, as well as a comprehension of the social function they have (Teale & Sulzby, 1986; Clay, 1991a; Solé & Teberosky, 2001). In a recent meta-analysis of studies conducted with English-speaking children (Scarborough, 1998), a wide variety of predictors of future reading abilities were examined. Comparing findings from 61 research samples, three sets of skill variables were identified: measures of the processing of print, measures of oral language proficiency and measures of nonverbal skills. Letter identification and phonological awareness skills, involving the process of print, were among the most predictive measures. Five areas of instruction have been identified as critical elements for success in teaching reading: phonemic awareness (the ability to identify and work with individual sounds in spoken words); phonics (the relationship between the sounds of the spoken language and the letters of the written language); fluency (the ability at the same time to recognise and comprehend words); vocabulary (the readers' knowledge of most of the words that are read, in order to take meaning from the text); and text comprehension (understanding what is read). All these elements were developed in an approach that uses various teaching methods to support reading and writing mastery. Reading and writing are considered as reciprocal processes and teachers are trained to use a method consisting in the gradual decline of teacher support and the gradual increase of student independence based on demonstrated proficiency (Clay, 1998).

Oral language development is supported for all learners across the framework of instruction, promoting vocabulary building and the use of accurate language structure. Oral language is the foundation for all the elements of early literacy learning (Cazden, 1992). An active oral engagement with each student is stressed as

each of the framework elements is used. Teachers are encouraged to consider literacy acquisition as a problem more linked to how to teach rather than what to teach—i.e. using literacy best practice as the primary element in teaching regardless of the content area. Without minimising the importance of other content areas, literacy learning is established as the highest priority. Classroom arrangement is a fundamental support for developing the instructional framework, including displays of the letters of the alphabet, names of the children, high-frequency words and recent works completed by the students.

The six elements of the framework for classroom instruction are as follows:

1. *Reading aloud to students*: this activity models the way in which reading is done, encourages the students to acquire reading skills, and allows them to experience a variety of forms and styles of writing. The listening and thinking skills used during reading aloud help students to develop comprehension skills (Adams, 1990; Clay, 1998).
2. *Shared reading*: this is commonly done with books or chart paper large enough to allow the group to see the print and follow along. The teacher points to the text while reading, selects explicit skills for direct instruction and observes the students' responses and behaviours (Pappas & Brown, 1987; Swartz *et al.*, 2002).
3. *Guided reading*: the teacher provides an introduction to the text and then observes the students as they read, assisting them in the problem-solving experience so as to promote future use of these skills (Clay, 1991a, 1991b; Lyons *et al.*, 1993; Fountas & Pinnell, 1996).
4. *Independent reading*: opportunities for independent reading should be part of each stage of students' literacy development, with familiar texts that students know from their reading aloud, shared reading and guided reading experiences (Clay, 1991b; Taylor, 1993).
5. *Interactive writing*: this is a process in which the students and the teacher collaborate in the construction of the text and share the role of scribe. The negotiation of a text is a process that develops planning skills, appropriate language structures and vocabulary (Button *et al.*, 1996; McCarrier *et al.*, 2000).
6. *Independent writing*: all students are given the time to write text, incorporating all they have learned (Clay, 1998).

Focus on the professional development of teachers

Helping teachers to become more effective in their work is proposed as a primary goal. The programme focuses on improving the teachers' classroom practices, based on a better understanding of the process of literacy learning and on a gradual decline of support based on observation of individual student growth, through a decision-making process about the ways to assist each student toward the goal of independence. Teachers are trained to improve their observation of students to better inform instruction, and in order to meet the needs and strengths of each student and to support them in the use of a variety of problem-solving strategies.

Teachers learn to use the elements of the instructional framework to structure classrooms that use literacy activities throughout every school day, coordinating their work at all grade levels. The training programme is based on a high level of confidence in the ability of teachers to become more efficient in their work, given appropriate training and long-term support (Marchesi & Martín, 1998). No specific classroom materials are recommended or required, rather the training helps teachers to use whatever instructional materials they have and to organise their teaching for maximum result (Swartz *et al.*, 2002).

Capacity building at school sites

The programme training is orientated to the school team of teachers and administrators, to ensure sustainability in the school change process. The training model provides intensive professional development with follow-up. Training a team of teachers and administrators is a year-long process. Follow-up support is provided through on-site training, class visits and monthly professional meetings. This capacity-building model ensures long-term support to the school change process (Reynolds & Cuttance, 1992; Hallinger & Leithwood, 1996).

Teachers who understand the process of literacy, who use teaching methods proven effective by research, and who are provided with professional development to improve their practice, are found to be key in achievement of educational goals (OECD, 1992). The urgent need for more effective early literacy support in schools that serves low-income children has been stressed by many international reports (Snow *et al.*, 1998).

In synthesis, and supported by good results obtained by CELL in similar educational environments, AILEM proposed a teachers' and administrators' training programme based on its key principles, in order to improve learning achievements in low performing schools.

Methodology

Participants

Nine of the 14 schools participating in the programme had kindergarten classrooms and completed the student follow-up. Participants included 16 pre-school teachers in Kindergarten and 16 primary teachers in 1st grade. Principals and primary coordinators from each school participated in the training sessions. All participants were qualified teachers and had received some in-service training related to the new National Curriculum, during the past five years. Previous teaching experience ranged from eight to 30 years.

All schools had one or two classrooms at each level, except for one (School Capitán Pastene), that had four classrooms at each level. In one of the schools, San Francisco de Mapuhue, the same pre-school teacher is in charge of the two kindergarten classrooms, one in the morning and the other in the afternoon. Classroom sizes are different in the schools, ranging from seven to 41 children in kindergarten and 16 to 42 in the 1st grade.

A total 333 kindergarten children and 429 1st-grade children participated in the assessment before the intervention, at the end of the school year 2002/03. 402 kindergarten children and 435 1st-grade children participated in the assessment at the end of the single school year intervention. Almost all children were Chilean, except some few boys and girls from other Latin American countries, including Argentina and Peru; home language was Spanish in all cases.

Procedure

Procedure included intensive teacher training workshops and various follow-up activities in participating schools. Trainers from the Foundation for Comprehensive Early Literacy Learning (USA) and the Faculty of Education conducted four week-long training sessions over a year and a half period. The multidisciplinary team of the Faculty of Education in the Pontificia Universidad Católica de Chile responsible for the AILEM programme, participated in the teacher training and also received advanced training in coaching and facilitation of the school change process.

These sessions included direct training in teaching methods of the framework of instruction described above, assessment procedures to design and modify instruction practices, and giving feedback on teachers' work using their new learning. Individual members of the Faculty of Education were assigned specific schools to provide ongoing support between training sessions. Faculty visited classrooms, provided coaching on a weekly basis and conducted professional development meetings of teachers to review and apply the teaching strategies provided during the training sessions, in order to achieve the learning outcomes established in the National Curriculum. Administrators at each school were also visited by the members of the PUC faculty to review the teachers' progress and the programme implementation plan.

These schools were labelled as 'critical' and assigned to the intervention programmes by the government, because their learning outcomes had not improved despite the additional support received within the educational system reform. Teachers attributed poor learning results to biological and social factors related to poverty that could not be compensated by the schools, which were also poorly equipped. These factors were causally related to low-quality instruction, characterised by low rates of student time-on-task and teacher communication of high academic expectations, frequent classroom interruptions and discipline problems. Pre-school and primary settings and routines presented key differences: personal care routines, fine motor skills and free play were emphasised in kindergarten classrooms, through painting, construction play and worksheets; formal reading and writing activities were the main focus of primary classrooms, all children using the same textbook. Environmental print and other books were almost absent in all settings.

Data collection process

Data were drawn from each participating school before and after the intervention, at the end of the school year 2001/02 and the school year 2002/03. All children

were assessed individually by their teachers and by the AILEM team members assigned to the schools. Literacy assessment in kindergarten included knowledge of the alphabet, knowledge of print, oral comprehension and reading and writing. The 1st-grade literacy assessment included knowledge of the alphabet, knowledge of print, reading proficiency, reading comprehension and writing, according to the learning outcomes established by the Chilean National Curriculum.

In order to evaluate the impact of the intervention, all the teachers participating in the AILEM programme rated their theoretical constructs of literacy learning and effective classroom instruction before and after the training sessions. Teachers were asked to rate their knowledge on a scale of 1 to 5, with 1 indicating a low level of knowledge and 5 indicating a high level of knowledge. Both aspects were presented separately. Teachers were also asked to write their personal views about the contributions and the difficulties they had faced during the implementation of the AILEM programme in their classrooms and schools.

Additionally, every four to five weeks, (over the course of the school year), each classroom was observed in order to evaluate the implementation of the instruction framework. These observations were conducted by one of the two faculties assigned to each school. At the end of the school year, each teacher participating in the programme was classified by the two members of the AILEM team supporting the programme implementation at his/her school, based on the field notes, the pictures and the videos they had taken during their visits to the classroom. Four implementation levels were considered, on a scale of 1 to 4, from low (1) to high (4). The checklist included the six elements for classroom instruction and the literacy environment. Each teacher had two independent classifications, from the faculties assigned to his/her school.

Results

Comparison between learning achievements in kindergarten and 1st grade at the end of the school year, before and after the intervention, evidenced a significant improvement during the school year of AILEM implementation. Subjects were assigned to one out of four achievement levels in both grades, according to the learning achievements expected at the end of each course in the National Curriculum. Low level includes the subjects below 60% of achievement. Average level includes the subjects in the range 60–69.99%. Good level includes children between 70% and 89.99% in achievement, and the high level those from 90% to 100%. As shown in Figure 1, the great majority of kindergarten children assessed were in the lowest level of achievement at the end of the school year 2002/03, before the intervention, and none of them had reached the highest level, meeting the content standards established in the National Curriculum. At the end of the first year of AILEM implementation, more than 40% of the children were still at the lowest level, but a similar percentage had reached a good level and 15% had reached the learning outcomes expected for this grade.
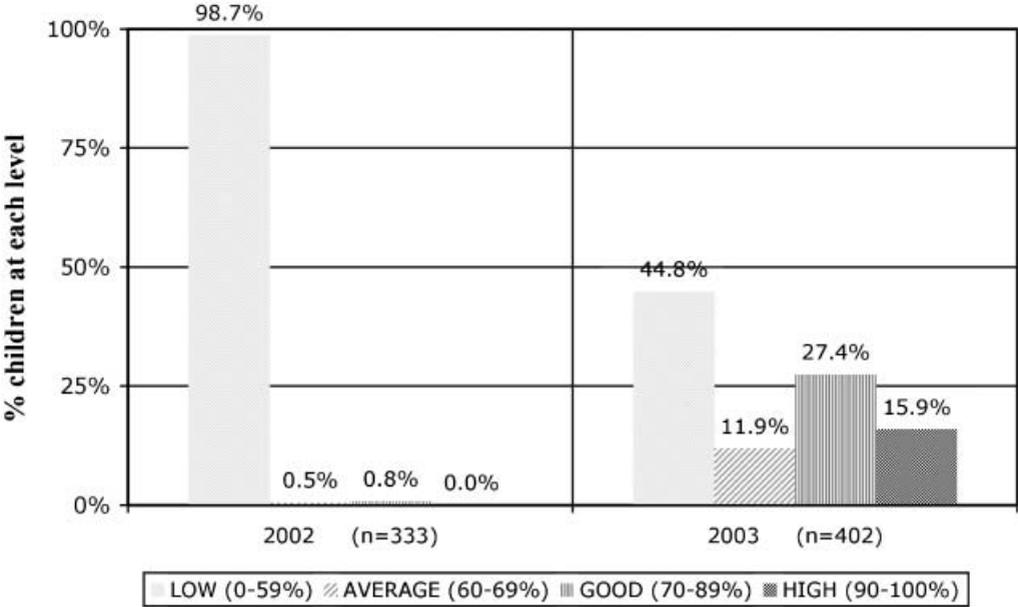
Figure 1. Comparison of percentage of kindergarten children at four achievement levels, at the end of the school year, before and after the intervention

Figure 2 compares the distribution of children at the end of 1st grade before and after the intervention. Literacy learning outcomes before the AILEM implementation at the schools were below 60% in almost 70% of the children assessed at the end of the school year, and less than 1%—four out of 429 children— had reached the learning outcomes defined for this grade. After the intervention, more than 60% of the children had reached an achievement defined as good and almost 30% were at the expected level at the end of this grade.

Even though all classrooms experienced an improvement of literacy learning achievement at the end of the school year, differences were observed in the amount of progress, in each classroom, in all schools. In order to explain these differences, average outcomes were related to the level of implementation of the AILEM programme in the classrooms, evaluated by the two members of the faculty assigned to each school. All teachers were assigned by two faculties to one of the four implementation levels, previously described, according to the observed use of the teaching strategies in their classrooms. Inter-judgement reliability was 0.91. The implementation average score was 2.7 for kindergarten teachers and 2.8 for 1st-grade teachers, so it was concluded that implementation level was not related to grade. As indicated in Figure 3, the implementation level was positively related to the learning outcomes of the teachers, and this difference was not significant.

Results from the questionnaire answered by the teachers, comparing their professional work before and after the AILEM training showed that teachers' perception about the training was positive. All of them experienced a positive change in their theoretical constructs of literacy learning and effective classroom instruction
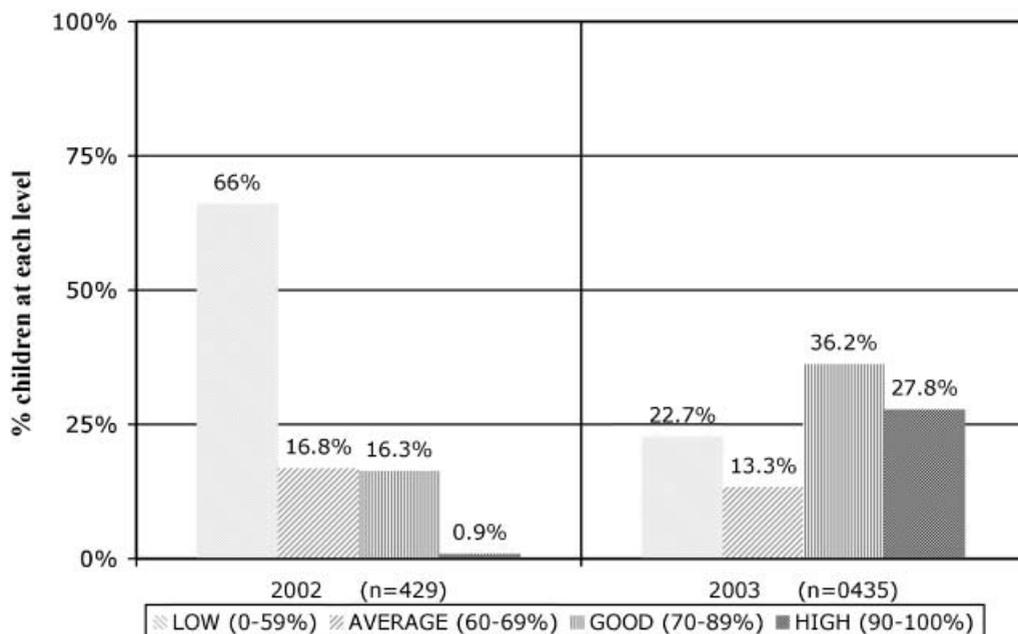
Figure 2. Comparison of percentage of 1st-grade children at four achievement levels at the end of the school year, before and after the intervention
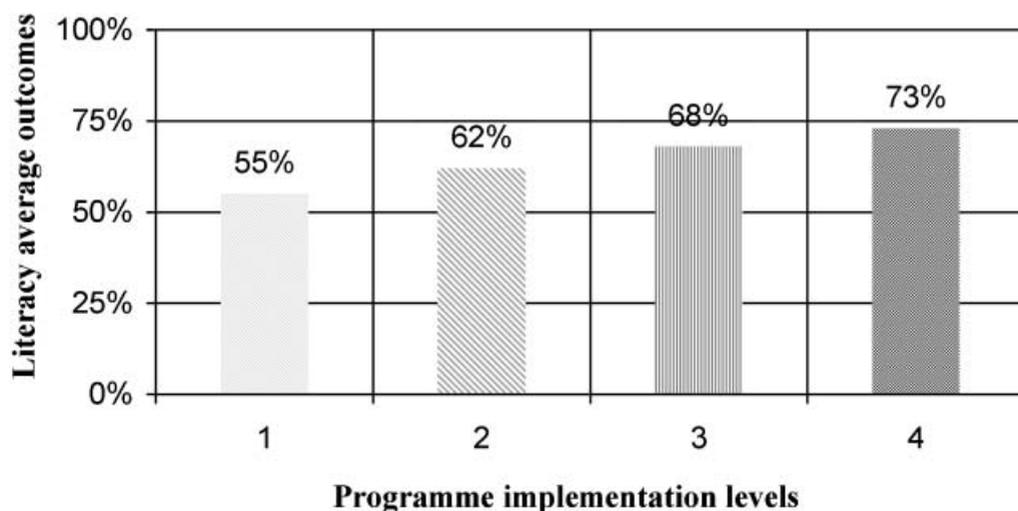

Figure 3. Literacy average outcomes related to programme implementation levels

as a consequence of the training sessions. On a five-point scale, the average score before the training was 2.8 and the average score after the training was 4.1. There were no significant differences between the two assessed areas and among teachers from different grades. Personal comments from the teachers expressed their experiences:

> It was difficult for me to change my routine, but the students appeared much more motivated to participate in these reading and writing activities, so they helped me to innovate my teaching methods. (primary teacher)

> This is the first time I feel I am recognised as a professional by the primary teachers of the school. We are working in a collaborative way to help each other to implement the teaching strategies, sharing our success and our difficulties. (pre-school teacher)

> Children don't mind if they make mistakes, they know they are learning and enjoy the experience of autonomy they get at each level. (primary teacher)

The pictures and video tapes that registered the implementation process during the faculty visits to the schools documented the changes introduced in the classroom practices. Print environment and a variety of texts, that were previously absent in all settings, evidenced the improvement of the learning context.

Discussion

A major objective in the present paper was to describe an intervention programme designed to improve literacy learning achievement in Chilean schools, serving to children from low-income families who had experienced no gains from previous support programmes. Recent studies conducted in Chile had evidenced that the quality of public programme support for language and literacy was rather low, despite the educational reform implemented in the country since 1990 (Eyzaguirre & Le Foulon, 2002). This intervention was funded by the Ministry of Education, in order to attend to the poor learning outcomes exhibited by these public schools.

It is necessary to point out the difficulty of obtaining definite conclusions from these preliminary results. Nevertheless, the present findings suggest that this kind of intervention seems to be appropriate for meeting the needs of the primary schools that serve this disadvantaged population. Classroom practices benefited from this structured and explicit programme of well-known instructional strategies for reading and writing skill development, beginning in kindergarten and continuing through the primary grades. The number of students meeting national educational goals increased substantially, even though this meaningful effect still falls far short of success for all children.

Overall analysis of the data highlights the apparent effectiveness of the AILEM programme, after a full school year of implementation. The kindergarten level shows the most impressive change in performance. Nevertheless, at least part of this success can be atributed to the implementation of literacy experiences that, in spite of being part of the new official programme, had not been effectively implemented in the kindergarten classrooms. The 1st-grade classrooms also experienced valuable progress in literacy outcomes at the end of the school year. From this early and intensive intervention, a higher proportion of students seem likely to be better prepared to succeed at school, even though learning outcomes after the intervention are far from meeting national content standards, because many students are still performing poorly in reading and writing and risk later underachievement in school. However, in both of the cases, it needs to be emphasised that proper control

conditions are lacking in order to ensure certainty regarding the results. A fully randomised design is necessary to examine the separate and combined effects of this intervention, including control groups and follow-up.

In order to impact teaching styles, the AILEM framework emphasised the alignment of teaching methods and content standards within and across grade levels, involving pre-school teachers, traditionally segregated, principals and elementary coordinators in a process of structural school reform. The focus was the professional development of teachers, whose previous training has been described as too much based upon theoretical aspects of teaching and too little based on practice (Filp, 1994; Eyzaguirre & Le Foulon, 2002). As a result of the training, teachers perceived an improvement in their professional capacities: a better understanding of the literacy learning process, more effective teaching practices and more collaborative work at the schools, orientated alligning teaching methods to meet National Curriculum standards. The observed positive correlation between the implementation of the teaching strategies in the classrooms and the students' outcomes was not significant, but suggests the AILEM instructional framework for classroom instruction may be an influential determinant in literacy learning. It is necessary to explain the differences among the teachers participating in the intervention programme, because even though all attended the same training sessions and had long-term support during the implementation of the framework in their classrooms, they exhibited differences in the level of implementation. A better understanding of the origin of such differences is fundamental in order to obtain better results in future regarding the teachers' training processes. It will be necessary, too, to attend to the possible influence of the intervention itself concerning these positive achievements. Thus, future studies should focus on the issue of sustainability over time of the results.

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