Improvement in reading processes through the MATEL Program

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ABSTRACT

Introduction. In this investigation we set out to study the relationship which exists between reading comprehension, speed and effectiveness. The circumstance which motivated this research was substantiation of a link between reading deficit and school failure in a group of secondary students belonging to a Rural Public School. (Almería, Spain).

Method. Faced with this situation, a group of the teachers together with the Educational Guidance Team decided to initiate an action-research process, namely applying and evaluating the MATEL program, whose purpose is to achieve reading effectiveness in the students involved by practicing a series of strategies which lead to improved reading comprehension and speed.

Results. We confirmed that comprehension and speed are associated with reading effectiveness, whereas such an association did not occur between speed and reading comprehension. The differences in averages between measurements taken confirm an effect of the treatment on the variability of the results (speed, comprehension and effectiveness).

Discussion. After applying the program during one schoolyear, results showed that the instruction was effective differentially. On one hand the students achieved significant improvement in their reading effectiveness, and on the other, they also significantly increased their reading speed. In the case of reading comprehension, although a significant increase was produced during most of the research period, it dropped at the end.

KEYWORDS: reading difficulties, intervention programs, reading processes.

INTRODUCTION

In a society where knowledge surrounds us and is being produced increasingly, it becomes necessary to process large quantities of information quickly and efficiently. Efficient reading is the great tool for doing so. From efficient reading one derives efficient writing and thus efficient learning as well. For students, reading is the main learning instrument, since most school activities are based on it. Reading is one of the most complex mechanisms a person can approach, since it involves decoding a system of abstract signs and symbols.

It has been substantiated, from some time back, that reading is an important factor to take into account when explaining school failure. We are witnessing a reading deficit shown by students in particular, and by the population in general. A large part of school failure is due to nearly always teaching the mechanics of deciphering written sounds, but on few occasions does one become a good reader (understanding, obtaining valid and usable information, etc.)

Until recently one of the factors that accounted for this reading deficiency, among educational professionals, was the ongoing dispute over learning methods, whether global or synthetic. Nowadays this dispute is past, one method as well as the other offers significant contributions. From the global method we retain "the importance of real reading from the first words learned globally and the need to give an important place to functional and affective aspects of learning" (Foucambert, 1989, p.15) and from synthetic methods "the systematic and rigorous presentation of lesser elements than the word and of the diverse components of written language" (Foucambret,1989, p. 15).

From our point of view, an exclusive approach of either analytic method or global method is erroneous; though one speaks of a learning method, it is evident that in reality they constitute teaching methods. Certainly there is a close relationship between teaching and learning, but what is really of interest is to know how the individual himself puts together his own learning; it is at this point where the student diversity yields individual levels of attainment. In any case, while developing he reading process, all students must put into play a series of cognitive processes and strategies that will be related to the purpose for which they are reading. The more or less ade-

quate use of these, as an ability to self-regulate, is key to the process. The acquisition or non-acquisition of these strategies is also linked to the subject's motivation and his own reading habit, among other variables.

Therefore, when approaching this investigation, we proposed the following objectives:

1) Analyze to what extent increase in speed influences reading effectiveness.
2) Investigate the relationship which exists between reading comprehension and reading effectiveness.
3) Analyze the influence that self-regulation together with speed and comprehension factors have on reading effectiveness.

METHOD

Subjects

The student sample was formed by a total of 28 students in the first cycle (first two years) of secondary school in a RPS (Rural Public School), their ages falling between 12 and 14. This RPS has educational units split between the villages of the district. Thus, the student body is made up of students from both villages and at educational levels ranging from early childhood education, primary education, and just the first two years of mandatory secondary education. The sociocultural level of the students is lower-middle and low. Only 38% of the population studied have any type of formal educational training (primary through university). Educational level of the families is shown in Table 1:

Table 1. Educational level of the students' families

LEVEL OF STUDIES	PERCENTAGE
Unable to read or write	3%
No formal schooling	59%
Primary school	16%
Mandatory secondary school	13%
1st Stage Occupational Training	4%
2nd Stage Occupational Training	1%
Bachillerato (pre-university secondary schooling)	1%
Basic university degree	2%
Post-graduate university degree	1%

Materials

The MATEL program does not claim to be the exclusive solution for students with problems, but rather a psycho-pedagogic action directed toward the whole of the class. Its ultimate purpose consists of facilitating learning of reading in such a way that each individual can recognize the way he or she is reading, and from this understanding help him or her to modify, correct or improve it. "The integration of reading strategies in the student's field of competencies will allow him to progress toward self-regulation of his own reading activity" (Serra and Oller, 1997, p. 24).

This program sets out some general objectives, some measurable, specific objectives, and other non-measurable objectives.

General objectives:

a.   Qualitatively improve the student's reading know-how by having him move from alphabetical behaviors to effective ideo-visual behaviors.

b.   Eliminate the consequences of having initially learned to read in an alphabetic fashion, giving greater priority to oral reproduction of the text to the detriment of the cognitive processes which constitute the real reading act. Help the student make this break in his reading habit, since this change can mean as much for many students.

c.   Help the student modify his passive attitude in reading and his expectations when faced with written material.

Specific measurable objectives:

a.   Attain with first-cycle secondary students a reading speed greater than 200 words per minute.

b.   With the same students, attain reading comprehension of greater than 70%.

c.   Obtain a good reading effectiveness index.

Specific, non-measurable objectives:

a.   Broaden the visual field at each fixation.

b. Decrease the time used at each fixation.

c. Decrease the number of ocular regressions.

e. Strengthen comprehension of text.

f. Practice reading anticipation and the hypothesis of sense.

g. Practice using any kind of text.

The Program exercises are structured into 9 series, each of which seeks to achieve very concrete objectives, such as:

Series 0: seeks to develop ocular mobility and agility. Visual warmup and attention development.

Series A: seeks to broaden the visual field at each fixation, exercise the capacity for visual discrimination and identification. Train short-term memory and choose personal strategies for finding words.

Serie B: seeks to increase the useful visual field at each fixation and impede ocular regressions.

Serie C: seeks to improve visual discrimination.

Serie D: seeks to develop speed in text exploration by using helpful strategies.

Serie E: seeks to reinforce anticipative behavior in order to better foresee upcoming information.

Serie F: seeks to evaluate the effectiveness of reading behavior from the parameters of speed and comprehension.

Serie H: seeks to facility the student's self-knowledge of the reading process in oral reading. Internalize the following principles:

1. Reading aloud presupposes an active and constant anticipation of the text. If this anticipation does not exist, there is no reading, but rather mechanical verbalization.

2. Reading aloud is reading for others. It is an act of communication and therefore it is necessary to use adequate and expressive intonation, meaning that one performs an ideovisual reading.

Essential elements for evaluating student progress during program implementation are carried out through SERIES F.

The action-research procedure.

The entire research process arose from a group of teachers at the Rural Public School, who, after evaluating and analyzing the students' level of curriculum competency, confirmed that a large part of existing school failure was due to miserably low reading effectiveness. Thus our investigation had the following phases:

1) *Approaching the problem.*

This group of teachers sought to improve reading effectiveness in their students, convinced that having met this objective, other objectives would fall into place, such as: academic success, pleasure in reading and therefore a reading habit and interest in discovering new knowledge and experiences.

We asked ourselves: what is reading? According to current theoretical and conceptual models (Sánchez, 1994, p. 131), we understand that it is the obtaining of significant information, and what may vary from one situation to another is what one wishes to do with this information: enjoy oneself, meditate, become informed, play, etc. "The objectives or intentions of reading, then, are what should indicate the what and the how of reading" (Grau,1997, p.34). Thus, reading begins well before the reading act; when we are selecting a text we are already reading, since the selective process itself is contributing information to us. We can therefore affirm that learning to read is learning to explore a text, sometimes quickly and other times slowly depending on our intent with regard to the text.

The reader's intent while reading influences what he gathers from it. Thus, with the same activity we perform different tasks: whether reading to find some specific information, reading to get a general idea, reading deeply in order to master a specific text, or reading to establish a critical opinion. A step further would be to love reading, and this means creating the need to turn to written material in whatever form: posters, advertisements, recipes, instructions, signs, poems, newspapers, etc.

2) *Identifying the problem.*

These were the questions asked: what is effective reading? and, what does good reading depend on? According to current research (Grau, 1997, p. 32; Serrejón, 1995, pp. 46-47 and Solé, 1992), an effective reader is one who reads quickly, understand what he or she reads, adapts reading speed and comprehension to the type of text being read and one's intent or purpose in reading, and remembers well what has been read.

The teachers involved in this experience believed that some basic aspects of reading effectiveness would be reading comprehension and speed, since a good reader reads quickly and understands well, and moreoever, the more quickly he reads, the more and the better he understands.

Thus we began to search among the relevant bibliograhy for materials or programs that fit both the objectives we wished to meet as well as the resources we had available. The MATEL Reading Program came into our hands (López Rubio, 1992) thanks to the Educational Guidance Team. This program bases its theory and practice on the idea that to achieve reading effectiveness it is necessary to attain good speed and good text comprehension, thus it was precisely what these teachers were aiming for.

According to the model of the MATEL Reading Program (López Rubio, 1992), in order to increase speed we must begin with the basics of what it is to read. When reading, our eyes move along in jumps or fixations where one or several words are grouped. Therefore, in order to increase speed we must seek the least possible number of fixations on each line, in a single fixation to include as many words as possible, to favor instantaneous interpretation of blocks of text, to strengthen the reader's concentration by means of rapid text assimilation and by decreasing lapses of idle time, and to increase capacity to learn texts by use of the reading-by-blocks technique. Additionally, and closely related to the above, in order to improve reading comprehension it is fundamental to explore the text well, meaning to understand what it is about before sitting down to work on it, then perform a good reading which should be at each individual's pace, a general reading and looking for the meaning of what is read.

Reading speed and comprehension are not two independent aspects in the reading process, they are so closely related that an increase in reading speed has been shown to improve reading comprehension quantitatively and qualitatively.

3) *Establishing the intervention hypotheses.*

Setting out from the previous model, the working hypotheses were established as follows:

1. Reading speed and comprehension will improve with training in reading skills of the following type: increasing visual field, visual discrimination and speed in text exploration.

2. Implementing the MATEL Program will contribute to increasing reading effectiveness in the students as a product of improvements in speed and comprehension.

4) *Intervention*

The experiment was carried out during the second and third trimesters of the 96/97 schoolyear. Although the project was supported by the entire teaching team in first cycle of secondary school, it was most implemented in the areas of Spanish language and literature and in foreign language (English). Total time invested in Program implementation was about 60 hours, spread over 7 months of work, with a weekly average of three hours divided into the following sessions:

- Individual training sessions. Here they worked on the A, B, C, D, E, G and H series. They were held in the students' own classroom and done independently by each student. Although everyone performed the same exercise, each one spent the time he deemed necessary. The teacher kept track of times and the students themselves recorded them. Four weekly sessions were held, coinciding with the class period for language arts, lasting about half hour per session, and distributed as follows:

Table 2. Weekly distribution of the program series

Weeks 1/3/5/7		Weeks 2/4/6/8	
Monday	Series O	Monday	Series C
Tuesday	Series A	Tuesday	Series D
Wednesday	Series F	Wednesday	Series F
Thursday	Series B	Thursday	Series E
Friday	Series H/J	Friday	Reflection

- Evaluation sessions. Although weekly evaluation sessions were held each Wednesday for about half an hour using series F, there were three points or assessments over the length of the process that would be later used as indicators for quantifying results. These were also held in the classroom, during the English class period. The person in charge of evaluation sessions was the guidance professional from the Educational Guidance Team. Evaluation sessions were distributed over the length of the Program as follows:

Table 3. Distribution of evaluation sessions

DATE	TEST	SCHOOL YEAR	ASSESSMENT
4-Dec-96	F.4	1st year of secondary	
11-Dec-96	F.1	1st year of secondary	1st assessment
8-Jan-97	F.6	1st year of secondary	
22-Jan-97	F.7	2nd year of secondary	
5-Feb-97	F.4	2nd year of secondary	
19-Feb-97	F.5	1st year of secondary	
5-Mar-97	F.8	2nd year of secondary	
19-Mar-97	F.2	2nd year of secondary	2nd assessment
9-Apr-97	F.6	2nd year of secondary	
23-Apr-97	F.9	2nd year of secondary	
7-May-97	F.7	1st year of secondary	
21-May-97	F.2	1st year of secondary	
4-Jun-97	F.3	2nd year of secondary	3rd assessment

- Shared reflection sessions. These were carried out every two weeks and took place in the multi-purpose room. Everyone involved in Program implementation participated in these: the students, the teaching team, and the Educational Guidance Team member. Through these reflection sessions we endeavored to analyze the Program's progress, making emphasis on positive and negative aspects noted, as well as proposals for improvement. We also performed analysis of results, and what is most important in our view, we tried to have students and teachers discover how improvement in reading effectiveness had repercussions in the teaching-learning process.

- Parent sessions. These were also held in the multi-purpose room, every two weeks, and lasting about two hours. Participants were the parents of the students involved, the teaching team, and the Educational Guidance Team member. Through the parent sessions we promoted an awareness of reading at the family level.

5) *Evaluation and Results Analysis*

Evaluation was carried out in the following phases:

1) Initial evaluation. Teachers evaluated the students with whom they would implement the program using tests to that effect from Series F (Sample or Practice Text and INICIAL ASSESSMENT TEST).

2) Process evaluation. This was aimed at detecting difficulties, objectives difficult to achieve, conceptual errors, as well as planning necessary mechanisms to overcome them. This was all in the framework of previously scheduled program follow-up meetings. During program implementation the MIDPOINT ASSESSMENT and the various tests were administered.

3) Final evaluation. This was accomplished using the FINAL ASSESSMENT TEST.

The teachers and the guidance professional carried out periodic (every two weeks) "non-structured interviews" with the students during the months that the experiment lasted. In the first ones, special emphasis was given to the need to improve reading effectiveness following results from the first evaluation. Later students were informed about implementaiton of a Program that would help them improve reading effectiveness through training in reading speed and compre-hension. In following interviews, once the Program was underway, students were asked to freely express their like or dislike of the different types of activities in the different series, as well as being encouraged to complete the task with a maximum of attention and concentration. As the weeks went on, interviews became more and more dynamic with the students taking on the larger

share of participation since they were enjoying the experience, to such a degree that they wished to increase the number of series worked on daily. Through these interviews they were given positive feedback and they were informed regarding their improvement, standstill, or for some odd week a decline in results. Two weeks before finishing the experiment, the interview focused on the subjects' opinion about the Program, both students as well as teachers and the guidance professional.

RESULTS

1. **Relationships between the different aspects studied.**

In order to establish the degree of associaiton between the variables studied (reading speed, comprehension and effectiveness), we carried out correlational analyses with all the direct scores obtained. Results are collected in Table 4.

Table 4. Pearson correlation coefficients (n=112)

	speed	comprehension	effectiveness
speed			
comprehension	.086		
effectiveness	.470 ****	.812 ****	

****   p <.0000

As can be seen, comprehension and speed are intimately associated with reading effectiveness, though in the first case to a greater degree. Nonetheless, reading speed and comprehension do not show any significant association.

2. Global effects of the intervention.

In order to confirm whether quantitative effects of our intervention were adequate, we carried out an analysis of differences of averages between the four measures taken. Results are shown in Table 5.

Table 5. Differences appearing (averages and standard deviation) between the different measurements of the variables studied, using repeated measure ANOVAs (n=27)

Variable	Measurements				F	signif.
	1	2	3	4		
Speed	113.00	110.03	105.46	123.35	F(3,25)=3.01 *	
	(25.53)	(13.74)	(15.46)	(35.91)		
Comprehension	41.78	40.71	65.00	21.96	F(3,25)=29.73 ****	
	(13.89)	(20.71)	(77.62)	(6.971)		
Effectiveness	17.82	23.71	17.96	21.96	F(3,25)=26.68 ****	
	(5.42)	(8.50)	(5.68)	(6.97)		
	* p<.05	**p<.01	***p<.001	****p<.0001		

Results illustrate different aspects. For all variables analyzed there is a clear effect of moment (treatment) in the variability of the results (speed, comprehension and effectiveness). Nonetheless, changes are not always produced in the same direction. Thus, while *speed* undergoes an increase at the end of the training period, the same does not occur with *reading comprehension*, which, after a increase, drops at the end of the intervention period. Finally, reading effectiveness, as the integrating index for the two previous ones clearly increases from the first moment until the last.

3. Effects of the intervention by school.

We also wanted to compare the evaluation differentiated by school. Results are collected in Table 6.

Table 6. Differences appearing (averages and standard deviation) between the different measurements in the variables studied, per repeated measure ANOVAs, for each school.

Variable	Measurements				F	signif.
	1	2	3	4		
School 1 (n=12)						
speed	103.00 (8.31)	97.25 (30.96)	110.66 (15.68)	112.16 (12.79)	F(3,9)=3.02	
comprehension	44.16 (15.64)	40.00 (24.12)	86.66 (115.78)	21.50 (5.91)	F(3,9)=19.40 ****	
effectiveness	17.33 (4.63)	24.66 (8.71)	19.41 (6.05)	21.50 (5.91)	F(3,9)=12.52 ***	
School 2 (n=16)						
speed	119.00 (31.38)	112.93 (15.75)	100.06 (14.20)	130.56 (44.47)	F(3,13)=15.01****	
comprehension	40.00 (12.64)	41.25 (18.57)	48.75 (18.92)	22.31 (7.85)	F(3,13)=32.97 ****	
effectiveness	18.18 (6.06)	23.00 (8.55)	16.87 (5.32)	22.31 (7.85)	F(3,13)=26.68 ****	
	* p<.05	**p<.01	***p<.001	****p<.0001		

Results denote a certain significance in the improvement of speed and comprehension. Observe the much more significant increase in speed at School 2. Comprehension, for its part, decreases noticeably in both cases. In the case of reading effectiveness, a significant increase is produced over the whole of the process at both schools.

DISCUSSION

In carrying out the final assessment of the experiment, we find it necessary to do so from two points of view: quantitative and qualitative.

a) *Quantitative*. We can indicate regarding the first hypothesis (*Reading speed and comprehension will improve with training in reading skills)*, that data obtained in the evaluation

allow us to assert this for speed, while for reading comprehension, it improves significantly at all times except at the end. Given that speed always increases in the same direction, one possible explanation would be that students are more attentive to the speed variable than to comprehension. This idea leads us to confirm that, given both variables are in reality closely related to reading effectiveness, students did not come to adequately self-regulate in the control and balance of the two variables.

Regarding the second hypothesis (*Implementation of a certain Program will contribute to increasing reading effectiveness in students as a product of improvement in speed and comprehension)*, we can state that reading effectiveness increased significantly in all cases.

Elsewhere, when analyzing the measurable objectives of the MATEL Program, we note with regard to the first objective ("achieve a reading speed greater than 200 words per minute), that only 7.14% of the sample did so, though it must be reported that 71.42% of the population did not reach 120 words per minute in the initial assessment test. In order to reach this objective, it would have been necessary to implement the program for a longer period of time.

Likewise, regarding the second objective ("achieve reading comprehension greater than 70%"), only 21.42% do so, but we must note again that 53.57% of the sample did not reach even 50% comprehension in the initial assessment.

Regarding the third objective (obtain a good reading effectiveness index), 50% of the sample surpassed 20% reading effectiveness, noting again that at the beginning of the Program only 28.57% reached 20% reading effectiveness.

b) *Qualitative.* We can deduce from successive interviews with the students and teachers involved, that the assessment is fully satisfactory for the following reasons:

- The Program does not tire those involved, on the contrary, the further into the program we were, the greater the enthusiasm, since they were perceiving positive results. Thus we affirm that the Program does not cause saturation in its participants.
- After students are trained in the Program and series are properly scheduled by

the teachers and guidance counselor involved, the students on their own are able to self-administer the daily activity to be worked on.

- The program forces students to maintain attention on one concrete activity during a period of time, thus also improving the subject's attention span and concentration.

- It is a great help to teachers of this cycle since it makes possible individualized assistance for each pupil over many sessions, specialized for development of certain reading skills.

- After working through one course, pupils scored most the work series with values close to 10.

Finally, we must report that, while writing was not specifically addressed, we saw how it benefited indirectly. These results surprised us since they had not been considered previously.

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