

Teacher Communicative Skill and Students' Reflexive Thinking

M. O. Valente, M. E. Santos, M. A. Rainho, M. H. Salema
Departamento de Educação da Faculdade de Ciências da Universidade de Lisboa
R. Ernesto de Vasconcelos, Bloco C1 – 1º Piso – 1700 Lisboa - PORTUGAL

ABSTRACT

This study is an extension of a larger project devoted to “Learning to Think”, the PROJECT DIANOIA, which has studied the impact of using metacognitive strategies in some curriculum teaching areas such as Languages and Science. The scope of the action intended with this current study, has considered the hypothesis that there is a constellation of communication skills that, once systematically and intentionally used by teachers, produces a positive effect on the students' reflexive thinking. The study was shaped as a participant–research and was conducted in Lisbon schools, the capital city, and Viseu, a country city, and was addressed to students in their mid-3rd and 4th grade.

Students from the classes of the same grades in the same schools whose teachers were not in the training sessions were used as the control group of the experiment.

The communicative skills were grouped as follows:

- 0- Allotting time to think
- I A - Eliciting viewpoints
- I B- Asking for clarification and reformulation of own ideas
- I C- Explanation of own ideas and interpretation of alien ideas
- II A- Explicitation of arguments
- II B- Identification of inconsistencies
- III A- Search of implicit arguments
- III B- Evidence of premises that invalidate conclusions
- IV A- Revision of short, medium and long term consequences
- IV B- Elaboration of alternatives, hypotheses and estimations

The training sessions for implementing communicative skills were conducted in the schools every other week, started with a discussion on a text written intentionally for each skill, and worked as a support for designing ways to implement the skill during the classes of the following weeks.

Students and teachers were tested before and after the intervention. Besides the main hypothesis, the study also intended to evaluate the effects on the teachers' attitudes towards

their professional development and the students perceptions about the learning environmet and schools self-concept.

INTRODUCTION

In many countries learning to think has been considered an urgent objective to be achieved by schools, since the decline of students capacity to think has been pointed out as one of the most relevant symptoms of the failure of schools to prepare them for life. As an answer to this, many contributions from different sources have come out and today we have a growing number of courses and programmes to meet our specific needs. "Project DIANOIA" has worked since 1986 in this area developing metacognitive strategies in some curriculum areas such as Portuguese Language (Salema, 1988 and Morais 1988), English Language (Gaspar, 1989), Chemistry Physics (Cruz, 1989) and Biology (Lobo, 1989), at Basic and Secondary Education as well as at the pre-service and in-service teacher training level. More specifically Project Dianoia has worked in Language and Science disciplines mainly in the areas of Text Comprehension, Text Production and Problem Solving.

This particular study we are now reporting must be considered as an extension of Project Dianoia and in a certain way it takes a distinct perspective of intervention, since it doesn't attempt to be specific about the nature of knowledge the teacher is working on. It does not intend to reorganize the structure of the knowledge. It is directed to some communicative skills of teachers, and assumes that these can promote their students' reflexive thinking.

OBJECTIVES AND HYPOTHESES

This study attempts to investigate means of facilitating the students' reflexive thinking through some specific teacher behaviors. More precisely, it has the objective of ascertain on students the effect of training teachers some communicative skills to use oriented to the promotion of students reflexive thinking. It also wants to investigate the effect of such training on the teachers attitudes about their own professional development. Additionally it intends to recognize the subsidiary effects that promotion of students reflexive thinking has on the perception they have about heir learning environment and on their school self concept. Specifically, this study tested the following hypotheses:

1. The intentional teacher training of specific communicative skills for use in the classroom increases the reflexive thinking of students as compared with those whose teachers did not receive such training.

2. The intentional teacher training of specific communicative skills for use in the classroom increases more the positive attitudes toward the learning environment of students as compared with those whose teachers did not receive such training.
3. The intentional teacher training of specific communicative skills for use in the classroom increases the school self concept of students as compared with those whose teachers did not receive such training.
4. The process of participation in teacher training sections connecting directly practice and research in the classroom increases the positive attitudes of teachers toward their professional development.

THE METHOD

This study has developed through three phases:

Phase I

- (a) Search and definition of the communicative skills considered to facilitate the students' reflexive thinking;
- (b) Search, definition and construction of instruments for measuring the students' cognitive performance related to the quality of their reflexive thinking;
- (c) Pre-testing of teachers and students;

Phase 2

Intervention during one year and a half in some classes of schools located in two different geographic and social areas of Portugal, through a specific system of training and research.

Phase 3

- (a) Post-testing;
- (b) Analysis of data;
- (c) Conclusions and revision of the implementation processes;

The Design

The study compared the performance of students at the end of the 4th grade in experimental and control classrooms

The design was a quasi-experimental one described as O1 x O2 // O3 - O4 where O1 and O2 are the observations before and after the treatment in experimental classes and O3 and O4 the observations in control classes at the same moments. X is the treatment during one year and a half consist of a participant training-research system with the teachers of experimental classes. The inclusion of control groups had the purpose of controlling spurious variables, such as the effects due to time (better relationship among teachers and students along the academic year, learning due to the regular curriculum, and students maturation) and the effect of measurement.

The Subjects

The subjects were teachers and students in their mid-3rd and 4th grades belonging at the beginning of the study to seven classes from a rural city and six classes from a school in the surroundings of Lisboa. After an aleatory choice six were considered as experimental and seven as control classes.

All students from control and experimental classrooms were pre and post-tested. At the end of the study some data had to be excluded, since some students changed from one class to another during the period of the study, and one teacher gave up for health reasons.

The Instruments

For assessing the reflexive thinking of students questionnaires were constructed each one related to one aspect of reflexive thinking as follows:

- Q. 1- Detecting errors
- Q. 2- Search of alternatives
- Q. 3- Analogical reasoning
- Q. 4- Recognizing symmetrical relationships
- Q. 5- Inductive reasoning
- Q. 6- Syllogistic reasoning (categorical)
- Q. 7- Valuing analogical reasoning
- Q. 8- Language translation: from verbal to graphic
- Q. 9- Detecting underlying assumptions
- Q. 10- Hypothesis testing

Q. 11- Recognizing and producing arguments

A school self-concept and a school learning environment instruments were also constructed and administered to students. A questionnaire connected with the attitudes teacher have about their professional development was also built and used.

The Treatment

The intervention consisted of a teacher training and research action we described as participant in which researchers and teachers had specific roles: the former by mediating conceptual frameworks and research results from other investigations, considered useful for the context of the study, and the latter the teachers, by giving the appropriate information about their settings, their reactions, their proposals for action, modulating to all ideas and proposals in order to transform them in locally usable strategies for the desirable outcomes.

The intervention occurred between March 1990 and June 1991. Teachers in the control classes did not receive any training, but because their students had to be pre- and post-tested, in order to get their support researchers make a contract with them in terms of postponing their training for the year 91-92. The teachers of the experimental classes had at the beginning of the project an intensive two day seminar followed by one half day meeting every other week. The methodology of training attempted to break with classic models of in-service training where there is an extensive offer of theoretical models or even practical suggestions but out of the context of the teachers specific work, expecting them to incorporate these offers in their daily work. Research has shown that many of these attempts did not result relevant. Without having teachers reinventing the teaching mechanisms necessary for the implementation of new strategies, and the continuous support and feed-back from others not very much is to be expected.

In the initial two day meeting, teachers worked these areas.

1. Reflexion on which communicative skills teachers use in their daily practices, they think do not allow students a good reflexive thinking experience.
2. Teachers behaviours that can stimulate students' reflexive thinking.
3. The constructivist approach of professional development.

4. The learning to thinking movement: why and what for.
5. Communicative skills and reflexive thinking.

In half-day meetings every other week, researchers and teachers prepared and worked out the plan for incorporating one and only one communicative skills from the constellation, selected for being relevant to promote the students reflexive thinking. Figure I shows the selected skills.

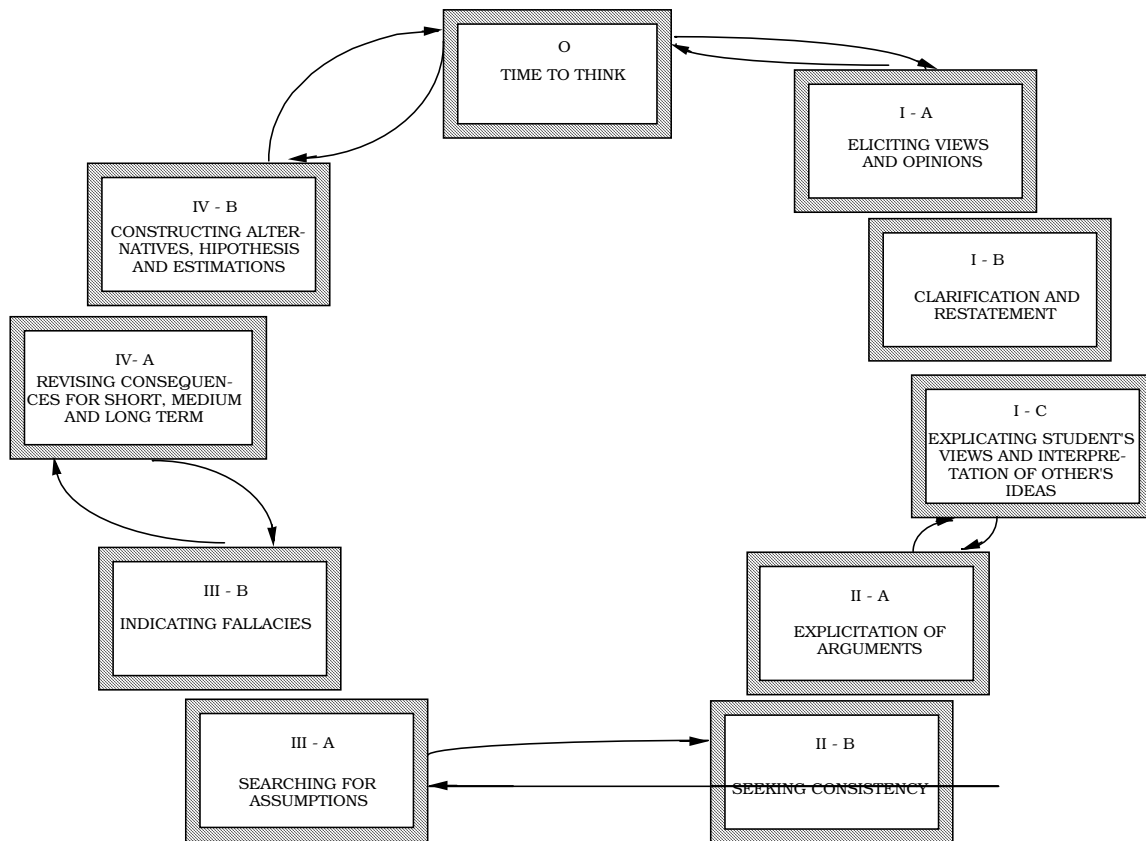


Figure I- Constellation of trained communicative skills

The work was conducted in the following pattern:

1. Evaluation of the work done in the classroom during the previous two weeks period based on general view and specific incidents registered in the teachers' diary: after each day the teachers registered what happened in their classrooms as a result of the systematic and deliberate initiatives regarding the specific communicative skill.

2. Inventory of problems that emerged and success or failure of attempts
3. Discussion of a text distributed in the previous meeting and related to the communicative skill to be reinforced during the following two weeks. These texts, one for each skill, were prepared by the researchers.
4. The participant planning of strategies to be developed with students in their classrooms during the following two weeks.

During this period of the intervention two other types of training took place.

- (a) Some teacher observation by researchers with feedback, only where they asked for, according to the contract between researchers and teachers
- (b) Some classes taught by the researchers when the teachers asked for, with the objective of getting a better insight of what could be done
- (c) Two meetings for general evaluation and exchange of ideas between the teachers in Viseu and Lisbon schools in the experimental classes. These meetings showed very clearly that it is necessary to adapt continuously and reformulate ideas and strategies based on the teachers' feedback describing and analyzing both their real problems and successes.

THE FINDINGS

In this study the qualitative observations are considered so important as the quantitative ones. The sources for the qualitative collection of information were the meetings in which continuous evaluation was done; the classroom observation, the materials produced by the teachers, namely their registers of planning and observations, the description of activities and their diaries. From these, it was clear that communicative skills teachers implemented more easily and with better results were:

- Eliciting viewpoints
- Asking for clarification and reformulation of own ideas
- Explanation of own ideas and interpretation of alien ideas
- Explicitation of arguments
- Identification of inconsistencies
- Search of implicit arguments
- Evidence of premises that invalidate conclusions

- Revision of short, medium and long term consequences
- Elaboration of alternatives, hypotheses and estimations.

As to the other communicative skills, teachers recognize only as being able to behave partly.

Teachers reinforced also other results useful for themselves and researchers could witness them:

- More self-esteem and security, more consciousness of gaps in classroom communication.
- More awareness of gaps in their initial teacher training and a strong desire to overcome them.
- More sensitivity to the processes of learning aiming at the quality of the products.
- The acquisition of the habit of using some of the trained communicative skills.
- Enthusiasm and empathy with the process and practice of a research-action-plan implemented with their own students as a way of professional development.
- Feeling better in other personal contexts out of school in which the trained communicative skills were transferred.

In students of experimental classes teachers and researchers observed:

- More self-confidence
- More self-domain
- More communicability
- Critical thinking
- Expansion of vocabulary
- Better text comprehension and text production
- More rigor when expressing
- Transfer of behaviors in out-of-classroom situations, specifically in family and community exchanges.
- Enthusiasm and pleasure when looking for new ideas
- Capacity for listening others
- Better approaches to solve problems

The quantitative data collected among students from experimental and control classes were analyzed and the mean of differences between post and pretests, as well as the standard deviations are in Table I.

From the t-test of the means of differences between of experimental and control subjects, we can conclude that we can influence the reflexive thinking of students when training intentionally and systematically some communicative skills to teachers.

This study needs to be continued and revised in some aspects:

1. The questionnaires for measuring the reflexive thinking of students must be reanalyzed and rewritten.
2. Some of the texts given to teachers need to be complemented and should offer more examples and a better description of alternatives.
3. Some of the skills of the constellation need more time for implementation and habit nurturing.

In spite of these recommendations for improvement, the study has given enough evidence of the importance of training some specific communicative skills directed to the promotion of students reflexive thinking.

REFERENCES

- Cruz, M.N. (1989). *Utilização de estratégias metacognitivas no desenvolvimento da capacidade de resolução de problemas — Um estudo com alunos de Física e Química do 10º ano*. Tese de Mestrado, Universidade de Lisboa. Lisboa: Projecto Dianóia.
- Gaspar, A. (1989). *Ensino de estratégias metacognitivas aplicadas à compreensão da leitura — uma intervenção no ensino do Inglês*. Tese de Mestrado, Universidade de Lisboa. Lisboa: Projecto Dianóia.
- Morais, M. M. (1988). *Pensar sobre o pensar: Ensino de estratégias metacognitivas para a recuperação de alunos do 7º ano na disciplina de Língua Portuguesa*. Tese de Mestrado, Universidade de Lisboa. Lisboa: Projecto Dianóia.
- Morais, M. M. (1989). Aprender a pensar: a compreensão da leitura. *Revista de Educação*, 3, 53-57.
- Novais, A. (1989). *Estratégias metacognitivas no desenvolvimento das capacidades básicas de pensamento envolvidas na resolução de problemas*. Tese de Mestrado, Universidade de Lisboa. Lisboa: Projecto Dianóia.

- Novais, A. & Cruz, M. N. (1989). O ensino das ciências, o desenvolvimento das capacidades metacognitivas e a resolução de problemas. *Revista de Educação*, 3, 65-75.
- Salema, M. H. (1988). *Aprender a pensar: A metacognição na composição escrita*. Tese de Mestrado, Universidade de Lisboa. Lisboa: Projecto Dianoia.
- Salema, M. H. (1989). Aprender a pensar: A composição escrita. *Revista de Educação*, 3, 59-63.
- Santos, M. E. (1991). *Mudança conceptual na sala de aula. Um desafio pedagógico*. Lisboa: Livros Horizonte.
- Valente, M. O. (1989). Projecto Dianoia: Uma aposta no sucesso escolar pelo reforço do pensar sobre o pensar. *Revista de Educação*, 3, 41-45.
- Valente, M. O, Gaspar, A., Lobo, A., Salema, M. H., Morais, M. M. & Cruz, M. N. (1987). *Aprender a pensar*. Lisboa: Departamento de Educação da FCUL, Projecto Dianoia.
- Valente, M. O, Gaspar, A., Lobo, A., Salema, M. H., Morais, M. M. & Cruz, M. N. (1989). *Aprender a pensar*. Lisboa: Departamento de Educação da FCUL, Projecto Dianoia.
- Valente, M. O, Salema, M. H., Morais, M. M. & Cruz, M. N. (1989). A metacognição. *Revista de Educação*, 3, 47-51.