

Texts and contexts in educational systems
Studies of recontextualising spaces

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Chapter 9

Texts and contexts in educational systems: Studies of recontextualising spaces

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Introduction

Educational researchers have studied curriculum organization and development at both the macro and micro levels using epistemological, psychological, and sociological approaches. However, in science education there is no widely accepted curriculum paradigm which directs either broad or systematic research. Without undervaluing other perspectives, we want to highlight the importance of a sociological approach for the development of such a curriculum paradigm.

We consider that Bernstein's model of pedagogic discourse (Bernstein, 1990, 1996) permits a comprehensive sociological analysis of the processes and relationships which characterise curriculum development at the macro and micro levels. It also allows an exploration of the autonomy which is given to teachers and textbook authors within the educational system. We think that both teachers and authors ought to be aware that the potentialities and limits of their pedagogic intervention, in terms of innovation, depend on the recontextualisations which can occur at the various levels of the educational system. Teachers are not necessarily only reproducers of the curriculum; they can be curriculum constructors. However, if they are to innovate, they must recognise the context and the possible influences to be taken into account in their activity, critically reflecting on the multiple paths open to them.

On the basis of the conceptualisation provided by Bernstein's model of pedagogic discourse, we have conducted extensive research centred on current Portuguese science education reform at the compulsory schooling level (ages 10-15). Here we have sought to study the sociological meaning of

changes that have been introduced and to analyse the degree and direction of the recontextualising which has taken place at the various levels of the pedagogic device. Our research includes a comparative study in which, for each level, we compare texts from the present period of science education reform (dating from 1991) with texts from the science education reform of the late 1960s and early 1970s. We aimed to study *the extent to which the texts of a science education reform contain a message of change or a message of continuity with regard to the sociological principles which characterise the multiple relationships present in educational action*. We aimed also to explore the *contextualising and recontextualising processes which can occur at the various levels of educational intervention in terms of the socio-political context in which reform takes place*.

It is important to grasp something of the character of the Portuguese socio-political situation. Portugal was a dictatorship for more than 40 years, becoming a democracy only in 1974. Due to both overt international pressure and the influence of educational changes in the USA, a reform of the educational system began in the late 1960s. This reform started at the level of the 5th and 6th years of schooling (ages 10–12+) and was known as the *Veiga Simão reform* after the minister of education of the time. New syllabuses were developed in science education. The pedagogic principles underlying these syllabuses departed in many crucial aspects from the principles established in the 1933 Constitution, which governed the country during the whole dictatorship period, and in the educational basic law of the time. External and internal pressures, together with the death of the dictator Salazar in 1970, created the conditions for the weakening of the regime. A new educational basic law was approved in 1973, containing some principles of a more open society which were not in accordance with the 1933 Constitution which was still in effect. The revolution which took place in 1974 found the educational system in a state of considerable incoherence. At this time, syllabuses for the 5th and 6th years, together with isolated educational experiences in middle and high school, were based on new content and quite open relations. In the unstable post-revolutionary year of 1975, and before a new constitution and educational basic law could be developed and approved, the reform had moved into the 7th year of schooling.

The present reform (1991) followed trends similar to those of the reforms in other countries such as the United Kingdom and Spain and was set in a well established democratic system, within a new constitution (1976) and a new educational basic law (1986). We wanted to see the extent to which it introduced changes from the reform of the late 1960s and early 1970s. While the present reform has taken place in a stabilised society

where constitution, educational basic law, and syllabuses followed each other in time and where contextualising and recontextualising can be coherently analysed, the earlier reform developed in a non-linear sequence, where change in the educational basic law came after the development of the 5th and 6th year syllabuses, under a dictatorial regime, and before the new 7th year syllabuses that were part of the same reform but were developed later, within a democratic system.

In this chapter, we start by presenting the theoretical framework which has guided our research. We refer briefly to the various levels and relations present in the production and reproduction of pedagogic discourse officially institutionalised as the pedagogic text to be used by teachers and textbook authors. We then proceed to the presentation and discussion of the study we have developed and undertaken on the basis of the model. Finally we offer a synthesis of the results suggested by our research, with particular emphasis on the potentialities offered by the model for a methodology which simultaneously operationalises that model and broadens its applications.

Theoretical Framework

Focusing on the distinctive characteristics which constitute and distinguish the specialised form of communication which is realised by pedagogic discourse, Bernstein (1990) constructs a model which seeks to show the multiple and complex relations which intervene in the production and reproduction of such discourse. In the model, the production of official pedagogic discourse is seen as the result of relations which are established at the generative and recontextualising levels of general regulative discourse. General regulative discourse contains the dominant principles of society and is generated as a result of the relations and influences between the State field and the fields of production (physical resources) and symbolic control (discursive resources). It is also, to a lesser or greater extent, under international influence. The State functions at the generative level to legitimise the principles of distribution of social power and control which are incorporated in official pedagogic discourse. However, official pedagogic discourse is not the mechanical result of the dominant principles of society because these principles undergo a recontextualising process. In this recontextualising process, two fields intervene directly—the official recontextualising field, which is directly controlled by the State, and the pedagogic recontext-

tualising field. They are both influenced by the fields of production and symbolic control and their main activity is the definition of the *what* and the *how* of pedagogic discourse. When pedagogic discourses produced at the level of the official and pedagogic recontextualising fields are inserted at the transmission level, they can still undergo a recontextualising process dependent on the specific context of each school and the pedagogic practice of each teacher. In this way, discourse reproduced in schools and classrooms is influenced by the relationships which characterise its specific transmission contexts. It can also be influenced by relations between schools and family and community contexts.

The model suggests that the production and reproduction of pedagogic discourse involve extremely dynamic processes. On the one hand, the dominant principles which are conveyed by general regulative discourse reflect positions of conflict rather than stable relationships. On the other hand, there are always potential and real sources of conflict, resistance, and inertia among the political and administrative agents of the official recontextualising field, among the various agents of the pedagogic recontextualising field, and between the primary context of the acquirer and the principles and practices of the school. Furthermore, teachers and textbook authors may feel unable or reluctant to reproduce the educational transmission code underlying official pedagogic discourse. It is this dynamism which enables change to take place. According to Bernstein, a pedagogic device which offers greater recontextualising possibilities through a greater number of fields and contexts involved, and/or a society characterised by a pluralistic political regime, can lead to a higher degree of recontextualising and, therefore, to greater space for change.

In Portugal, the syllabus of a given discipline embodies the official pedagogic discourse produced by the Ministry of Education, the official recontextualising field agent. This official text carries messages containing the principles and norms which constitute the general regulative discourse that characterises a given socio-political context. However, as a pedagogic text it also carries messages which reflect a set of options, considered adequate to a given educational context, which are influenced by various fields. The textbooks for a given syllabus express this discourse produced in the pedagogic recontextualising field. Although translating the principles legitimised by the syllabus, they also reflect options which depend on the multiple relations between different pedagogic fields.

Pedagogic discourse embeds instructional and regulative discourse, in such a way that the latter incorporates and dominates the former. A specific

instructional discourse refers to knowledges and cognitive competences, and a specific regulative discourse refers to values, attitudes, and socio-affective competences which establish order, relation, and identity in the teaching-learning context.

The conceptualisation and the empirical properties of the model enable analysis of the sociological messages present in a given pedagogic text (syllabus, textbook, teacher's practice) with respect to the multiple relations which characterise the teaching-learning process. This analysis involves considering the messages in terms of the *what* and the *how of* pedagogic discourse, that is, in terms of what is to be transmitted and how it is to be transmitted. The model also makes possible analysis of the sociological messages presented to teachers in a given syllabus by the Ministry of Education. We have considered the messages in terms of the control used by the Ministry of Education to make teachers and textbook authors conform to its values as to the *what* and the *how*.

In such an analysis, it is important to characterise the *what* of pedagogic discourse not only as the values given to instructional and regulative discourses but also as the emphasis, within these discourses, given to cognitive and socio-affective competences of distinct levels of complexity. In the characterisation of the *how of* pedagogic discourse and of Ministry of Education-teacher relations, the sociological relations between categories (subjects, discourses, spaces) become areas of analytical interest. These relations entail power and control relations which are characterised in terms of classification and framing. The research we have been carrying out is centred on the production of the pedagogic discourse at the generative and recontextualising levels, analysing the sociological messages contained in texts produced in two distinct periods in terms of socio-political context and curriculum development.

Application of the Pedagogic Discourse Model in the Analysis of Science Curriculum Reforms: Exemplar Research Studies

In our study we started from the assumption that the analysis of changes introduced by a given educational reform is deepened if those changes are compared with previous reforms and explored in terms of the socio-political context in which they took place. For that reason, our study compared the sociological messages contained in the syllabuses of our present reform period with the messages contained in syllabuses of the previ-

ous reform period. We also studied the recontextualising which occurs between the principles of general and educational policies present in constitutions and basic laws and the pedagogic guidelines given by syllabuses and between the syllabuses and the textbooks (Figure 1).

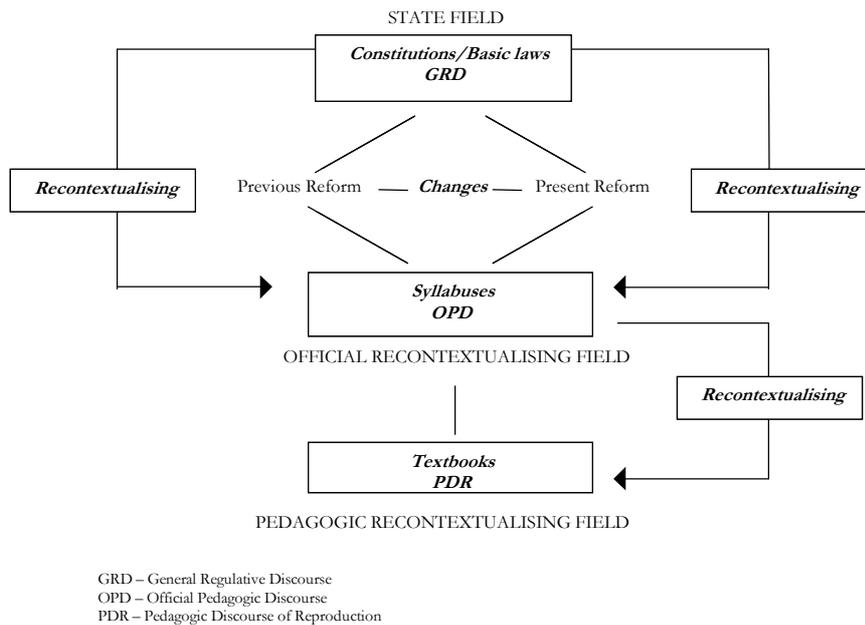


Figure 1—General diagram of relations analysed.

The focus was on analysing science syllabuses and textbooks in use in various years of compulsory schooling. Space restrictions permit us to describe only the studies centred on natural science syllabuses. However, brief reference will be made to studies of other disciplines and textbooks.

Relations underlying the teaching-learning process

The studies carried out by Morais, Neves, and Fontinhas (1999), Morais and Neves (1999), Neves and Morais (1997), and Neves, Morais, Medeiros, and Peneda (1999) addressed the following research question: *What is the extent*

to which the present science education reform changes the text of syllabuses, in terms of the relations underlying the teaching-learning process?

These studies focused on the natural science syllabuses in use in the 5th/6th, and 7th years of schooling (ages 10–13⁺)¹ and were centred on two aspects of the teaching-learning process: (a) the value given to different discourses and competences; and (b) the value given to various teaching-learning relations (Figure 2).

We used a qualitative approach based on an interpretative model. Our unit of analysis² was the sentence.³ The analysis not only focused on syllabus sections which contained the guidelines specifically related to the discipline but also on sections which referred to general aspects of the whole curriculum and which might also contain guidelines related to the discipline.

To characterise the sociological messages contained in the syllabus texts, we defined indicators for each one of the relations under analysis. At the empirical level, that definition followed the criteria for the nature of those relations and the specificity of distinct syllabus sections. In order to compare the various syllabuses at the level of their global message and at the level of the message contained in distinct syllabus sections, sentences were grouped in five categories. Two categories referred to the curricular dimension and three to the disciplinary dimension. We classified all the sentences contained in the syllabuses and calculated their percentage distribution in terms of the indicators selected by the whole syllabus and by each of its dimensions (curricular and disciplinary).

Analysis of the value given to different discourses and competences was based on sentences which referred to “contents” related to general regulative discourse (GRD), specific instructional and regulative discourses (SID, SRD), and simple and complex cognitive and socio-affective competences (SC, CC, SSA, CSA). According to the theoretical framework of analysis and taking into account the limitations inherent in analysis applied to a syllabus, the criteria for identifying sentences were as follows:

- a. when the sentence referred only to the educational macro level, expressing intentions and general principles about knowledges, values, and attitudes to be considered in the general educational context, it was classified as transmitting the GRD;

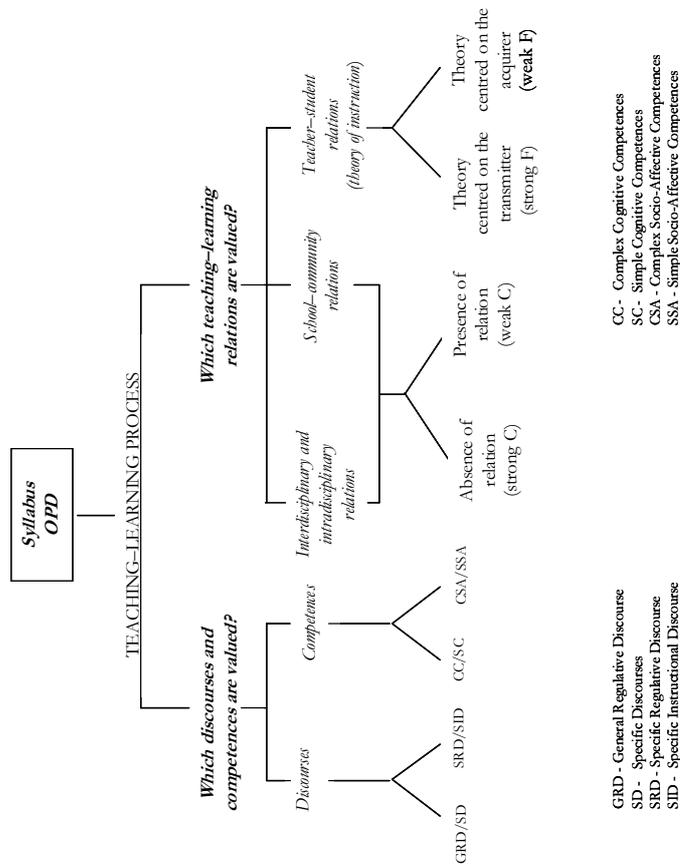


Figure 2—Diagram of the relations underlying the teaching-framing process.

- b. when the sentence referred to the micro level of the classroom, expressing knowledges and competences to be developed in the teaching-learning process, it was classified as transmitting the specific discourse (SID if the sentence was focused on cognitive knowledges and competences and SRD if the sentence was focused on attitudes and socio-affective competences);
- c. sentences containing SID were classified as valuing CC whenever they referred to concepts at a high level of abstraction or expressed complex cognitive competences even if factual knowledge or concepts at a low level of abstraction were their referents⁴ and they were classified as valuing SC whenever both knowledges and competences were of a low cognitive level;
- d. sentences containing SRD were classified as valuing CSA whenever they referred to values or expressed attitudes at a complex level and they were classified as valuing SSA whenever competences valued were of a simple level;⁵
- e. although complex competences presuppose simple competences, if the sentence expressed only complex competences, these were the only ones considered; only when the sentence clearly expressed the two types of competences were both considered.⁶

The indicator of the value given to different discourses and competences was the percentage distribution of sentences containing the following comparative elements: (a) general regulative discourse in relation to specific instructional and regulative discourses; (b) specific instructional discourse in relation to specific regulative discourse; (c) within specific instructional discourse, complex cognitive competences in relation to simple competences; within specific regulative discourse, complex socio-affective competences in relation to simple competences. We also analysed the kind of values and the kind of competences of higher levels of complexity which are emphasised in syllabuses.

Analysis of the value given to various teaching-learning relations was centred on interdisciplinary and intradisciplinary relations, school-community relations, and teacher-student relations. This analysis was made on the basis of the percentage distribution of sentences which indicated a

distinct degree of relation between the categories under study. To characterise the degree of relation of each sentence we used a 3 point scale for classification (C^{++} , C^+ , C^-) or framing (F^{++} , F^+ , F^-) relations. According to these scales, the highest value (C^{++} or F^{++}) means absence of relation and the lowest value (C^- or F^-) means presence of relation; the intermediate values (C^+ or F^+) mean little explicit relation. The values of these scales were established on the basis of criteria derived from a previous analysis of all sentences. That analysis allowed an identification of the empirical indicators that were more adequate to the type of relations under study and to the particular nature of the various parts of the text under analysis. For example, the scale we constructed to analyse interdisciplinary relations contained three degrees of classification defined according to the following criteria:

- a. C^{++} – the sentence omitted knowledge of other disciplines and referred exclusively to knowledge of the discipline under analysis;
- b. C^+ – the sentence contained references to other curricular disciplines, although those references were vague or implicit;
- c. C^- – the sentence contained references to other curricular disciplines, pointing explicitly to relations between their knowledge and the knowledge of the discipline under analysis.⁷

The scale we constructed to analyse the teacher-student relation and its implied theory of instruction contained three degrees of framing defined according to the following criteria:

- a. F^{++} – the sentence contained statements which gave a clear emphasis to the directive role of the teacher in the teaching-learning process (for example, the teacher “tells”, “informs”, “explains”) or the sentence referred to cognitive and/or socio-affective competences which suggest little intervention by the student and indicate that the syllabus values a theory of instruction more or less exclusively centred on the transmitter;
- b. F^+ – the sentence contained statements which emphasised the orientating role of the teacher in the teaching-learning process (for example, the teacher “guides”, “accompanies”, “appeals to the student’s participation”) or when the sentence referred to cognitive

and/or socio-affective competences which suggest some participation of the student and indicate that the syllabus values a theory of instruction which, although centred on the transmitter, also considers student intervention;

- c. F⁻ – the sentence contained statements which emphasised a higher degree of intervention of the student in the teaching-learning process (for example, the student engages in “free activities”, “independent tasks”, or “project work”) or when the sentence referred to cognitive and/or socio-affective competences which suggest a higher degree of student autonomy indicating that the syllabus values a theory of instruction mainly centred on the acquirer.⁸

The studies revealed that current science syllabuses contain a global message which

- a. gives more value to the regulative dimension of learning;
- b. reinforces the importance given to the competences of higher levels of complexity (especially socio-affective competences);
- c. gives greater emphasis to interdisciplinary and intradisciplinary relations and to school-community relations; and
- d. gives less control to the acquirer in teacher-student relations (i.e., legitimises a theory of instruction less centred on the acquirer).

Changes were more evident (and sometimes only present) in the 7th year of schooling. The studies also revealed that in present science syllabuses the values and kinds of cognitive and socio-affective competences of higher levels of complexity are intended to reflect principles seen to be oriented to a democratic society (e.g., freedom, solidarity, responsibility, cooperation) and competences related to functional scientific literacy (e.g., scientific inquiry competences, metacognitive competences) and to higher personal and social development (e.g., self-confidence, persistence, justice, truth). These kind of values and competences were already present in the previous reform but they are now more diverse and clearly specified. Indeed, the studies suggest that change has gone mostly in the direction of reinforcing these principles.

In spite of these changes, our present science syllabuses contain a global sociological message which does not substantially alter the principles which characterised earlier syllabus relations. In fact, the change is not as great as we might expect in face of the social principles which characterise our present, democratic society. However, when the curricular and disciplinary dimensions of the syllabuses are analysed separately, we see that there are some differences in the sociological messages they contain. It is in the curricular dimension of the syllabuses that the regulative dimension of learning is more apparent, the cognitive and socio-affective competences of higher levels of complexity and interdisciplinary and school-community relations more valued, and a theory of instruction more centred on the student legitimised. These differences suggest the recontextualising which can occur, within the same syllabus, when passing from curricular intentions to guidelines specifically directed to a discipline. As a consequence of this recontextualising, the curricular innovations which are introduced in a reform may be submersed in the syllabuses' global message.

The recontextualising which is evident in the syllabuses of the two reforms (although it is greater in the previous reform than in the present reform) leads to a reflection on what should be done when syllabuses are changed. If the educational principles expressed in the general intentions of the curriculum are not effectively present in the specific guidelines for a discipline, change intentions will be in jeopardy. It can be argued that, provided innovation is present in curricular guidelines, teachers can, in an autonomous and flexible way, manage the disciplinary components of the syllabus. However, since teachers' actions depend on their pedagogic education and ideology, teachers may not use the space for intervention that they possess. For that reason, change intentions should assume an explicit form in the specific guidelines of a discipline. Although this would constitute reduction of teachers' control in relation to officially legitimised principles, it could be argued that it is important and justifiable when teachers have not received an education which permits reflection on the meaning of the sociological messages contained at various syllabus levels.

In order to widen and deepen our analyses of the sociological meaning of changes introduced in the present science education reform, in terms of the relations underlying the teaching-learning process, we developed further studies centred on physics and chemistry syllabuses for the 8th and 9th years of schooling⁹ (Lopes, 1998; Nascimento, 1998) and textbooks for natural science in the 7th year of schooling (Lourenço, 1997; Lourenço & Neves, 1998). Analyses of the physics and chemistry syllabuses reflect the

trends in natural science syllabus discussed above, reinforcing the idea that innovations intended in the general curriculum are neither fully nor clearly present in the specific discipline guidelines. Recontextualising within syllabus, from the curricular to the disciplinary level, approximates the sociological messages contained in the discipline guidelines in both these cases.

Our study of natural science textbooks for the 7th year revealed differences between the sociological messages contained in them, generally according to the relationship under analysis and the syllabus. In general, their messages were less innovative than those expressed by the whole syllabus. Our study suggested a different degree of recontextualising between the pedagogic discourse of textbooks and the two dimensions of the syllabus, the curricular and disciplinary levels. There is more recontextualising in relation to the general curricular principles and less recontextualising in relation to the specific guidelines for the discipline.

Overall, current science education reform reveals potential changes in the curricular directions of syllabuses but these are blurred in specific discipline guidelines and in textbooks. This raises important questions about processes and relations in effective implementation of an educational reform. The importance of the pedagogic education and ideology of teachers and textbook authors to curriculum development appears as a crucial aspect to be considered when innovation is intended.

Ministry of Education-teacher relations: Potentialities and limits of teacher intervention

The study carried out by Morais and Neves (1999) addressed the following research question: *What are the changes introduced by the present science education reform syllabuses with regard to Ministry of Education-teacher relations?* The study was centred on the natural science syllabuses of the 5th/6th, and 7th years of schooling, and we followed a methodology similar to that already described.

We started from the assumption that the Ministry of Education-teacher relation was one of transmitter (Ministry of Education) and acquirer (teacher, textbook author) in which the official pedagogic discourse contained in the syllabus constituted a text to be transmitted-acquired. Ministry of Education-teacher relations were analysed in terms of the control exerted by the Ministry on teachers and textbook authors in its directions about official pedagogic discourse. Two aspects of the Ministry of Education's control were considered. The first was its degree with regard to the peda-

gogic text to be “acquired” (implemented) by teachers and textbook authors, and the second was the form of communication used by the Ministry in conveying its intentions. For the first, we used the degree of content explicitness of the syllabus as an indicator; for the second, the presence or absence of the reasons given by the Ministry of Education about syllabus construction and implementation (Figure 3).

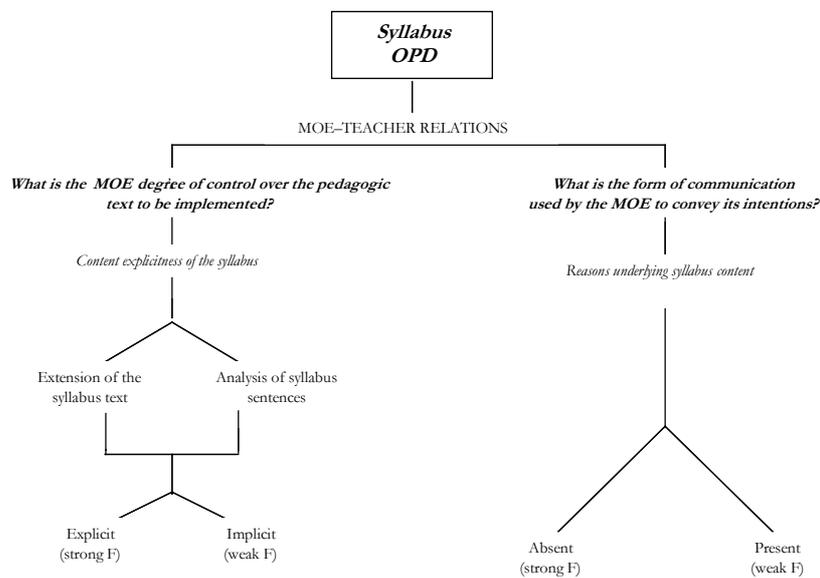


Figure 3—Diagram of Ministry of Education (MOE)-teacher relations.

The degree of content explicitness of the syllabus was measured by considering its extent and the framing value of each sentence. The extent of the syllabus text was measured by the number of sentences contained in it as a whole and the percentage devoted to each syllabus dimension. We assumed that more text means greater explicitness. Sentence analysis was done using a 3 point scale for framing, where the highest value expresses a higher degree of content explicitness and the lowest value expressed less explicitness. In the analysis we used the following criteria: F⁺⁺—the sentence expressed in a detailed and/or “directive” way what the Ministry of Education intended, making the syllabus content very explicit; F⁺—the sen-

tence expressed in a relatively specific and/or slightly “directive” way what the Ministry of Education intended, making the syllabus content less explicit; F⁻ —the sentence expressed in a vague and/or “flexible” way what the Ministry of Education intended, making the syllabus content mostly implicit. The indicators used for classifying the sentences took into account the specific nature of syllabus topics.

For example, at the level of curricular aims, when a sentence referred to an objective expressed in a very clear and precise way we gave it the value F⁺⁺, when the sentence referred to an objective expressed in a not very precise way we gave it the value F⁺, and when the sentence referred to an objective expressed in a very vague way we gave it the value F⁻. At the disciplinary level, the sentences which contained expressions such as “should be done” or “it is intended that” were classified as F⁺⁺ because they transmit the idea of a relatively directive attitude from the Ministry of Education, leaving teachers no space for freedom of action in whatever direction; the sentences which contained expressions like “the teacher can”, “we suggest that” were classified as F⁺ because, in this case, the idea of a more permissive attitude on the part of the Ministry of Education is transmitted, leaving the teacher some freedom of action; and the sentences which contained expressions like “the teacher has autonomy”, “according to his/her experience”, “the teacher can change” were classified as F⁻, expressing a fairly open attitude on the part of the Ministry of Education, leaving teachers a greater degree of freedom of action.¹⁰

When the Ministry gives teachers reasons for its directions, the Ministry is using an interpersonal form of control (weak framing). When reasons are not given, the Ministry is using a positional form of control (strong framing).¹¹

The study revealed differences between the two reforms, present and past, with regard to the degree of explicitness of the Ministry of Education’s intentions and to the form of communication used by the Ministry in expressing its intentions. In our present science syllabuses, directions are more explicit about the text to be transmitted in the teaching-learning context and these directions are given through a more interpersonal form of communication. This suggests a higher degree of control over the pedagogic text to be implemented and, at the same time, a more open form of communication by the Ministry of Education in telling teachers and textbook authors of its intentions. This seems to reveal a preoccupation by the Ministry of Education with passing on the “new” message of the syllabuses in such a way as to give teachers access to the principles which guided their creation.

Such access may guarantee more effective accomplishment of the Ministry's intentions.

The study also revealed that the Ministry of Education's control is now different with respect to the curricular and disciplinary dimensions of the syllabuses. In the curricular dimension there is, in general, a greater explicitness in syllabus content in the present reform in comparison with the earlier change. The Ministry of Education's control over the pedagogic text to be implemented tends to be greater in the present reform than in the previous one. In contrast, the explicitness of the disciplinary dimension was similar or even greater in the previous reform in comparison with the present one, so that at the level of specific disciplinary guidelines there now tends to be less control. However, it is at the level of the syllabuses' curricular dimension that the Ministry of Education's intentions are made explicit, in both reforms though now through a more interpersonal form of communication.

It is also interesting to note that whereas change towards greater explicitness is more evident in the 5th/6th years, change towards a more interpersonal form of communication is more evident in the 7th year. Comparing these results with our earlier findings, we may now note that the syllabus which in the present reform revealed less change in the pedagogic text (5th/6th years) is the syllabus where there was greater explicitness with regard to pedagogic text by the Ministry of Education. The 7th year syllabus, where change in the pedagogic text was more evident, shows less explicitness. It seems, that, whereas at the lower level of schooling the main intention is to reinforce the pedagogic text legitimised in the previous reform, at the higher level of schooling the main intention is to introduce changes in the pedagogic text itself.

The dominant principles of society and curricular reform: The influence of the socio-political context

The studies carried out by Fontes, Morais, and Neves (1996 a, 1996b) and Neves and Morais (1999, 2000) analysed the dominant principles of society and their relation to the pedagogic principles established in syllabuses including the natural science syllabuses of the 5th/6th, and 7th years. Analyses focused on official general policy and educational policy texts including political constitutions and basic laws¹² asking: *What is the extent to which science syllabuses embody a recontextualising of the dominant principles of society and to what extent does the socio-political context influence the degree and direction of that recontextu-*

alising? Once more, we used an approach similar to that described above, qualitatively analysing the principles contained in the political constitutions and basic laws associated with each reform period.

The general regulative discourse present in general policy (constitutions) and in educational policy (basic laws) was analysed in terms of the *hierarchical structure of society* and a set of norms/values which express *principles of order and social identity* (Figure 4). Although interrelated, these dimensions correspond analytically to the nature of power relations between categories (agencies, agents, discourses) which represent various sectors of society and the nature of norms/values which direct social conduct.

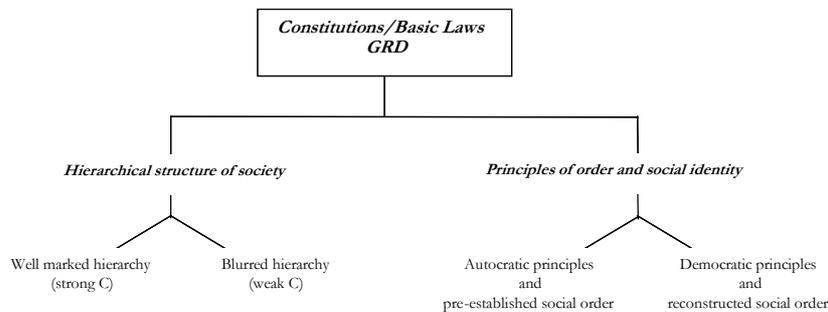


Figure 4—Diagram indicating the sociological principles underlying the constitutions/ basic laws.

To characterise the power relations between the categories under study we used a 4 point scale of classification (C⁺⁺, C⁺, C⁻, C⁻⁻), where the highest value (C⁺⁺) suggests a well marked hierarchy and the lowest value (C⁻⁻) a blurred hierarchy. We then attributed to each sentence a given classification value.¹³ The classification relations expressed in the texts under study gave us a general trend relative to the *hierarchical structure of society*. For the characterisation of the norms/values which express the *principles of order and social identity*, we considered the cognitive competences, knowledges, and values/attitudes legitimised in the texts under study. We analysed the various sentences and we grouped them according to the indicators referred to above. From an overall or global appreciation of the norms/values¹⁴ present in each set of sentences, we synthesised them in two sets of princi-

ples—autocratic principles/pre-established social order and democratic principles/reconstructed social order.

The studies showed that there are differences between the two periods, revealing the specificity of the socio-political context in which the two curriculum reforms were carried out. The Constitution of 1933 and its revision in 1971 privileged a very strong classification between categories representing the various sectors of society, suggesting a strongly hierarchical structure of society dominated by dictatorial principles in which the social order is pre-established. The constitution of the period of the present reform (1976, revised 1982) reveals a weakening in classification, which suggests a less hierarchical structure of society and the legitimising of democratic principles as the social order is reconstructed. Differences found between the basic laws of the two periods reflect differences in political constitutions with regard to classification relations. With respect to the principles of order and social identity, the analysis revealed that the democratic principles contained in the present basic law (1986) already existed to some extent in the law of 1973 when they co-existed with dictatorial principles, displaying contradictions with regard to the values expressed.

The studies also showed that there is not a total correspondence between the sociological messages expressed in the constitutions and basic laws of either of the two periods and that this is more marked in the former period than in the present one. This suggests that there is some recontextualising of the dominant principles of general political discourse (constitutions) to the guiding principles of the educational political discourse (basic laws) and also that this recontextualising tended to be greater in the former period of reform.

When we considered the relation between the syllabuses' overall message and the dominant principles of society, it appeared that syllabus changes have not been as great as might be expected in light of the democratic principles which characterise present Portuguese society. However, the difference between general regulative discourse and official pedagogic discourse does not mean that the message of the latter subverts the former. Rather, it means that the dominant principles of society became diluted, weakening the message they contain. It was also interesting to note that the differences between the curricular and disciplinary dimensions of syllabuses suggest a closer relation between general regulative discourse and official pedagogic discourse at the level of curricular directions than at the level of disciplinary guidelines. When we considered the socio-political context in which reforms were implemented, a greater recontextualising of the domi-

nant principles of society was evident in earlier reform syllabuses than in present syllabuses, representing a change from autocratic to democratic principles in the former, whereas, in the present period, recontextualising produces only a small change in the direction of less democratic principles than those expressed in the constitution.

We are led to some conclusions about the processes which interfere in the production of the educational discourse. Our findings seem to contradict the idea that recontextualising tends to increase within socio-political conditions which offer greater space of change, for we found greater differences between constitutions and basic laws and general regulative discourse and official pedagogic discourse in the earlier period. Since we were, in the period of that reform, in the presence of an autocratic regime, we would anticipate less recontextualising space. However, a deeper analysis of the socio-political context reveals data which show the contradiction to be more apparent than real. When the former reform started to be implemented, it was a time of some social instability in which political and economic change reflected, to some extent, the increasing influence of the fields of production and of symbolic control. It is in this period that the Parliament brought together some groups opposing the regime, whose presence led to the creation of opposition, conflict, and resistance. It was also in this period that the hybrid 1973 Basic Law was passed and compulsory schooling was extended. The messages of the 1973 Basic Law and of the syllabuses of the same period were influenced not only by ongoing socio-political changes but by educational theories of the field of symbolic control which, at the international level, were valued as better than indigenous beliefs, particularly at the level of compulsory schooling.

Final Considerations

The dominant principles of society are contextualised and recontextualised in the sociological messages transmitted by reformed educational syllabuses influenced in degree and direction by their socio-political context. Syllabus guidelines are contextualised and recontextualised in textbook guidelines.

Our studies centred on science syllabuses suggest that the present curricular reform introduced slight overall changes in teaching-learning relations but quite marked changes in Ministry of Education-teacher relations. The overall relations valued in the present reform express, to a greater or

lesser extent, the principles of a democratic society and were already in part valued in previous reform syllabuses. The Ministry of Education-teacher relations reflected in the present reform carry a message of greater explicitness in the pedagogic text embedded in a more interpersonal form of communication. This may suggest that the Ministry of Education is telling teachers to do more efficiently what they have always done. This may lead students to learn the same things they were supposed to learn in the past.

Our studies also suggest that changes introduced by the present reform are more evident at the level of the general intentions of the curriculum than at the level of specific discipline guidelines, and that the general intention express a message closer to the principles established in the constitution/basic law. There is evidence that textbooks covering the same syllabus transmit different messages and that these are closer to the discipline guidelines than to the curricular principles of the syllabus. This suggests recontextualising processes. These processes are important to an understanding of the real meaning of changes. In any reform, the official pedagogic discourse reflects a recontextualising of the general regulative discourse. Our work shows that the recontextualising was greater in the earlier reform than in the present one. This might seem contradictory because the previous reform began to be implemented under a dictatorial regime while the present reform has been implemented in a stabilised democratic regime. However, this evidence reinforces the explanatory potentialities offered by the model at the empirical level, where we see that although State official texts legitimised strong hierarchical relations and autocratic principles in which social order was imposed, conditions already existed in the pre-revolutionary period for innovative curricula.

Our research reveals the multiplicity of factors involved in the implementation of reform and also shows how, at the level of the pedagogic device, there are reproduction and recontextualising processes which are decisive in giving more or less relative autonomy to education. It is possible to say that changes in the dominant principles of society give rise, in general, to changes in the sociological messages transmitted by the pedagogic discourse of syllabuses and textbooks. The contextualising of the general regulative discourse of society in its pedagogic discourse reveals the processes of reproduction of its dominant principles and the relation of dependence of education to those principles. The neutrality which is often attributed to education is, in fact, more apparent than real. Education has autonomy, which is relative, and the relations to which we have referred illustrate that relativity precisely. However, it is also the case that the sociological mes-

sages of syllabuses and textbooks do not totally reproduce the dominant principles of society. There are differences which express distinct changes of direction and degree according to the period in which the reform is made, embodied in the recontextualising of general regulative discourse in pedagogic discourse. The autonomous character of education will be greater if the socio-political context of the time leaves greater space open to recontextualising. A factor which plays an important part in this process is the character of the agents and their ideologies which are located in the various recontextualising fields and within the same field. For example, our research showed that curriculum guidelines and discipline guidelines were produced by different groups of educators, who were hired by the Ministry of Education to construct the syllabuses within the official recontextualising field. The discipline guidelines were constructed by science teachers, whereas the curriculum guidelines were constructed by general educators. This was certainly one reason for recontextualising within the same field.

The application of the model in the analyses we carried out required an operationalization of its concepts, through a language of description which was adequate to each of the relations under analysis and which made possible their comparison at various levels. This methodological aspect constitutes, in terms of the model's application, a fundamental (if not the most fundamental) dimension of the research, given the potentialities revealed in the analysis and interpretation of the results obtained at the various levels of application. The methodology has revealed not only the complexity of the relations and processes which underlie the implementation of an educational reform but also the great explanatory power of the theoretical model used in the analysis of those relations. It shows how crucial, in educational research, is the use of methods of analysis which have the potential to be applied to various levels of the pedagogic device and in the context of distinct disciplines.

It is important to point out that our research did not explore either real teachers' practices or the real control of the Ministry of Education over the implementation of syllabuses at the level of teachers' practices. According to the classification of Robitaille et al. (1993), we can say that we have explored the "intentional curriculum" and not the "implemented curriculum" or the "attained curriculum". For this reason, the messages expressed by the texts analysed should be taken as representing intentions only and not as representing indicators of what is effectively transmitted or practiced, let alone acquired. The degree of correspondence between the transmitted and the acquired depends on the degree of centralised control the Ministry of

Education exerts over the evaluation system. Compulsory schooling in Portugal is centralised at the transmission level but not at the acquisition level, with reduced control by the Ministry of Education over evaluation. To reflect upon a real change brought by the present educational reform at this level would require analysis of the messages contained in the text as they were really implemented by teachers.¹⁵

The studies conducted involved texts produced at various levels of the educational system, and they focused on syllabuses and textbooks of various science disciplines in various schooling years. Further studies of other syllabuses and textbooks that include analyses centred on real teachers' practices and are conducted in the context of other educational systems are indispensable if the proposed methodology is to open up new paths in educational research at the level of science curriculum development. We believe that the research already carried out makes some contribution in this direction.

Notes

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1. See SEEBS (1975a, 1975b) and DGEBS (1991a, 1991b, 1991c, 1991d). Syllabuses for the 5th and 6th years were analysed together because they are part of the same cycle of studies. Thus, we use "5th/6th" in the text.
2. The analysis involved a dialectic relation between theoretical and empirical components. An external language of description was developed on the basis of the theory of the internal language of description underlying the study. In other words, we did not follow an orthodox content analysis, which is often concerned with apparently self-announcing contents (Bernstein, 1996, p. 136). Instead, we used principles of description for constructing what are to count as empirical relations and for translating those relations into conceptual relations as described in chapter 8 of the present volume.
3. The "sentence" is not taken here in a grammatical sense; it corresponds to a portion of the text containing one or more sentences which, as a whole, have a given semantic meaning.
4. For example, problem solving requires high level cognitive competences even when the concept(s) involved are of a low level of abstraction.
5. The distinction between simple and complex socio-affective competences depends on

the idea that students' conduct may embody only dispositions to accept/follow/receive given norms or to respond/react to those norms. It can also embody attitudes which reveal that the student has interiorised a set of specific values, and is starting to construct his/her own system of values and to act according to that system. From this point of view, fulfilling previously given orders and revealing obedience are examples of simple competences. Revealing responsibility or co-operation in group activities gives examples of complex competences. In a way, simple competences reveal attitudes which, from the point of view of social relations, are positional (students' conduct is directed by pre-established norms); complex competences reveal more interpersonal attitudes (students' conduct is directed by negotiated norms/principles).

6. The following sentences illustrate this classification:

General regulative discourse

From this follows the need for promoting the child's awareness of his/her surroundings so that a sense of responsibility for the environment, society, and culture is inculcated.

Specific instructional discourse

Simple cognitive competences

Learn the location of distinct lithological formations [...].

Complex cognitive competences

Understand that materials' circulation in a food chain corresponds to energy transferences.

Specific regulative discourse

Simple socio-affective competences

Respect general norms [...].

Complex socio-affective competences

Promote the recognition of the social value of labour in all of its forms and promote a sense of help and co-operation.

7. Examples of such sentences indicating *Interdisciplinary relations* were:

C⁺⁺ – Understand that materials' circulation in a food chain corresponds to energy transferences.

C⁺ – [...] it was considered important to take into account the economic aspects of fauna and flora.

C⁻ – [...] Develop interdisciplinary projects which lead to actions in recovery of areas of damaged spaces [...].

8. Examples of sentences portraying *Teacher-student relations (theory of instruction)* were:

F⁺⁺ – Among the sedimentary formations with an organic origin, refer to coals and oils [...].

F⁺ – The teacher should find general processes to intervene in the orientation of students' work [...].

F⁻ – Collect [the students'] information about environmental conditions.

9. See DGEBS (1991b, 1995).

10. Examples of sentences on MOE control of curriculum were:
 - F + + – When developing the learning process, it is intended to organise information in terms of fundamental concepts.
 - F + – The suggestions which follow should be taken as examples which can be used by the teacher as a starting point for the development of each one of the syllabuses' themes.
 - F – – The study of each one of the human body systems may be carried out following the sequence indicated or teachers may change it according to their experience or students' requests.

11. Examples of sentences underlying the *Presence of reasons* (interpersonal control—weak framing) were:
 - Use a prudent approach when teaching this theme [life transmission] by taking into account ethical and affective aspects, as sexuality is a global multifaceted reality [...].
 - Recycling the same notion several times does not mean repetition, as there are varying degrees of conceptualisation according to different developmental levels.

12. See Assembleia Nacional (1933, 1971, 1973), Assembleia da República (1976, 1982), and Ministry of Education (1986).

13. Examples of sentences relating to the dominant principles of society were:
 - Relations between subjects*
 - C - - – All Portuguese have the right to education and culture.
 - Relations between agencies*
 - C + + – Education provided by the State [...] will obey the principles established in the Constitution [...].
 - Relations between discourses*
 - C - - – The State does not have the right to programme education and culture according to any philosophical, aesthetic, political, ideological, or religious directions. (1976 Constitution)
 - C + + – Arts and sciences will be supported and protected in their development, education [...] provided the Constitution, the hierarchy, and the State coordination action are respected. (1933 Constitution)

14. Some examples of overall principles expressed in the constitutions/basic laws were:
 - Intellectual education, mental discipline, scientific mind, nationalism, authoritarianism, hierarchy, willingness, responsibility. (1933 Constitution/1973 Basic Law)
 - Humanistic, artistic, physical, scientific, and technological education. Critical and creative thinking. Responsibility, autonomy, solidarity, co-operation, liberty, equality. (1976 Constitution/1986 Basic Law)

15. Other studies have focused on the analysis of teachers' pedagogic practices (Morais et al., 1992, 1993, 2000).

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