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AUTHOR Maclure, Stuart
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ABSTRACT

This publication is one in a series of case studies dealing with educational innovation in various western European countries and the United States. This particular report discusses educational innovation in Sweden. The author attempts to describe the basic structure and character of the Swedish educational system, in addition to examining specific educational innovations and strategies for reform. In his analysis, the author concentrates primarily on describing, rather than criticizing or commending, the Swedish situation. The appendix contains a descriptive table listing school research projects underway in Sweden during the 1968-69 school year. (JG)

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INNOVATION IN EDUCATION

- SWEDEN -

by

Stuart Maclure, Editor of The Times
Educational Supplement, London, England.
The report is based on a visit to Sweden
by Mr. Maclure and Mr. Krste Crvenkovski,
Presednik Saveza Komunista Makedonise,
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TABLE OF CONTENTS

PREFACE

The following case study is one in a series of five dealing with innovation in education. All the studies are descriptive in nature and, as the work of five different authors writing in their personal capacity, they represent five quite individual syntheses and interpretations of vast amounts of information. Yet the confusion that might be expected from this method does not result. What emerges from these studies is instead a reasonably coherent statement of educational responses to the post-war demands of many more people for more and better education.

Perhaps it is not remarkable that the demands have been exerted so consistently on such a variety of nations, nor that the response to them has for the most part been so quick and positive. The nations examined in this book are remarkably similar in that all have a long and honourable tradition of public education, an industrialised economy and a high standard of living. At first glance it even appears that their solutions to the problem posed by recent educational demands are unusually similar: structural reform, curricular reform, compensatory and/or individualised learning systems - examples of each are easy to find in any setting. Yet a closer reading of the five case studies reveals wide and interesting variations: in priorities, in perceived solutions, in strategies evolved or developed to implement them.

Such variety of course reflects to a large extent differences in 'national climate', that peculiar combination of values, objectives, aims and administrative tradition which, aside from language, makes a nation distinctive. The explication of these differences is thus a hidden theme of the five case studies taken as a whole, and an understanding of this hidden theme is necessary to illuminate the more obvious themes of change and growth.

An explanation of this point can be found by comparing, even superficially, Scandinavian countries such as Norway and Sweden on the one hand and the United States of America on the other. At least from the viewpoint of the outside observer, Norway and Sweden have much in common. Both relatively small in terms of population, they can also claim a remarkably unified social and value structure. Furthermore, their style - if such a generalisation can be made - seems to be to have a clear idea of goals and then to set about methodically reaching them. This process is aided by the existence of strong central governments which are able to plan and to legislate with a reasonably clear assurance that what they propose will be achieved. Thus there exists in Norway the National Council for Innovation in Education whose mandate it is to make reality of reform laws passed by the central Parliament. The Parliament, concerned in recent years with "large questions of the role of schools in Society", and sure enough of its constituency, has concerned itself largely with structural reform and new curricula - on a national scale.

The situation in the United States is quite different, even if the question of relative size of total population is ignored. The American federal government is based on a system of checks and balances so fine that it is often hard to determine either the source of impetus or its ultimate manifestation. The situation is further complicated by the well-protected existence of states' rights - particularly the control of education - and, once the issue of taxation is raised, by municipal and regional claims as well. Perhaps more important, the rich diversity of the American population inevitably means conflicting social and ethnic interests, values, and views of national priorities. The past decade of American life has indeed been one of fast-changing goals and objectives and of massive social upheaval. Much of the upheaval has connected itself to education and made demands accordingly: in the light of this political and social back-ground, it is not surprising that American education responded by producing such a variety of innovations in every area and at every level that the final array can be quite bewildering, whilst at the same time providing a vast reservoir of experience for others.

England and the Federal Republic of Germany likewise provide differences quite distinctly their own. Writing of her own country's approach to recent educational change, the author of the English case study notes.

> ".....the English style is distinctive. You can seize on it instantly. There is no acceptance of common objectives, except in the most general sense which inspired the last major education act: the need to widen opportunities and eliminate the poverty both of individual children and of the public provision of education. There is no national plan for education, no law which specifies where development is necessary as in some OECD countries. There is almost no theory. The point is characteristically made in a recent major report on education : 'we invited the help of a number of distinguished educationists and professors of educational philosophy ... They all confirmed the view that general statements of aims were of limited value and that a pragmatic approach to education was likely to be more fruitful.'"

The reference to "two decades of non-reform" in German education, a phrase coined by Professor S.B. Robinsohn, is slowly becoming eroded, especially during the last two years, which have been marked by fundamental changes in many parts of the school system. With increasing co-operation between the Länder and with the initiatives of the new Ministry for Education and Science, the need for a more systematic approach to educational reform, and especially to educational experimentation, seems more important in Germany today than in many other countries.

Despite these differences in background and style, the five country studies do show one overriding problem in common: the need to change and improve their educational systems. Furthermore, as their experience increases, they all face the reality that explicit measures to facilitate the management of educational change are necessary, that innovation and improvement cannot be haphazardly left to chance.

A NOTE ON THE SWEDISH ADMINISTRATIVE SYSTEM

For the sake of clarity elsewhere in this report it is necessary to include a brief note on the Swedish administrative system as it applies to education and educational innovation.

Swedish Ministries are, by international standards, small. They are the secretariats for the Ministers, concerned with the political and economic policies for which the Ministers are answerable to Parliament. They are concerned with policy planning on a short and long term basis.

Much of the work which would fall to a Ministry in most European countries is done by independent boards - in the case of education, the National Board of Education (responsible for schools) and the Office of the Chancellor of the Universities (responsible for higher education). These independent boards administer the law of education.

Local administration is in the hands of the elected local municipalities who number more than 900(1)-(for a population of 7.8 million)-and most of which are very small.

National policy is to give more power to the local authorities and to reduce their number. The curriculum is firmly controlled from the centre, though an increasing discretion is being given to local authorities over optional areas of the curriculum. The costs of education are divided as to 60 per cent from the State and 40 per cent from the municipality. Teacher's salaries are tied to state grants.

In addition to the municipalities, powers are delegated to county education boards which are decentralised organs of the central government.

Also of great importance are ad hoc Royal Commissions set up from time to time to prepare recommendations on major aspects of policy. In some cases these Commissions include strong political representation as in the case of the 1946 Commission which formulated the proposals laying down the main lines of comprehensive reform. In others, though the public interest is always clearly represented, experts may be more to the fore.

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(1) The number of education authorities was reduced to 464 by amalgamation of districts in 1971.

PART I

EDUCATIONAL INNOVATION IN SWEDEN: INTRODUCTION

Sweden's strategy of change in education is coherent and self-conscious. It is articulated to a degree which is unusual among OECD countries. It is based on the formulation of objectives at every stage and level, and the application of consistent planning procedures to achieve those objectives.

The strategy is now being adapted to the concept of 'rolling reform', by which is understood a continual process of evaluation and renewal. The aim is to make innovation a permanent state in which curriculum and organisation are under constant review in the quest for better responses to changing circumstances, new knowledge, more effective learning and better use of resources.

Before going on to describe the strategy in greater detail and to indicate some of the directions in which innovation in Swedish education is pointing, it is necessary first to discuss some of the background factors. These include the political basis of Swedish educational reform, the strongly centralised nature of Swedish educational administration, and the characteristics of the Swedish teaching profession.

Political Commitment

At the centre of the strategy is a clear political commitment. This needs to be stated at the outset. The Swedish approach to educational reform can only be understood in the light of a solid political consensus. All the main political parties now accept the objectives of the comprehensive school which are, in effect, the objectives of Swedish education. This is not to say that there is no controversy, nor that earlier decisions were easy to reach. But what stands out as abundantly clear is that the reform has its origin in bold decisions taken on political and social grounds and that the commitment to social equality and mass education which these decisions entailed has now become part of the Swedish way of life - no longer a matter of acrimonious debate, but rather part of the political climate.

The reforms emanate from a Royal Commission set up in 1946. During the second world war there had been lengthy debates on the future of Swedish education. The system at that time was divided. The education of most of the children was limited to the elementary school. Only a small proportion were taken out of the elementary school for selective secondary education. Commissions of experts had produced a succession of reports in which there were conflicting proposals. The 1946 Commission, in which the politicians were strongly represented, cut through the pedagogic controversies and demanded a policy squarely based on social and political premises. In effect, they asserted that education was too important to be left to the educational experts. Instead of allowing pedagogic considerations to determine educational organisation, the Commission insisted that the

educational system, a potent agent of social control, should be subordinated to basic social policies, and in particular to ideals of social equality and co-operation on the one hand, and the development of individual talent on the other.

Here, in the jargon used by American curriculum experts, was the unambiguous assertion of 'societal' interests from the outset. Just as this has remained dominant in discussion of the aims of the education system as a whole, so too has it applied to the application of reforms at every level. The Royal Commission technique has been applied to the comprehensive school (with the Comprehensive School Committee of 1957) and the gymnasium (the Gymnasium Committee) and to subsequent investigation of the fackskola (continuation school) and entry to higher education. All these commissions operated under directives which interpreted the main over-riding policy objectives.

This is something which has to be borne in mind in connection with the research and investigation carried out for these commissions, as the OECD report on Educational Policy and Planning in Sweden (1967) made clear. The interplay between the politicians and social scientists has amounted to a dialogue inside and outside the several Royal Commissions. Much of the dialogue is inconclusive: policy in the end has had to be based on judgement, aided but not determined, by research. Professor Husen's comment, quoted in the OECD document, already referred to, is still to the point: the research findings' 'first and foremost importance lay in the fact that they have contributed to removing a host of prejudices and showing that what was involved in the debate were value judgements rather than facts. The school reform is, after all, a political question'.

It seems important to stress this from the start, especially as there could conceivably be a temptation as 'rolling reform' relies on techniques of Research and Development, to expect too much of the research function. The objectives are based on political conviction, not research. If - to take an extreme case - political will demands as an objective that water should flow uphill it would be imprudent to expect research to provide conclusive evidence on which to base such a policy.

The political will which lies behind Swedish educational policy has to be seen against the background of the Swedish political system in which the present governing party has occupied a leading role since the early 1930's. It is this long-term stability of political control which has made possible the ordered educational reform and the careful preparation which has preceded each stage of its application. It has also provided the healing element of time by which much of the heat can be removed from the bitterest controversy. And this same political stability, which has facilitated long term educational reform itself, possibly stems from a social homogeneity and common purpose in a close knit community of less than 8 million people, which makes the direction of the reform generally popular.

Central Administration

If the clarity with which social and political goals have been articulated is the first key to an understanding of Swedish educational reform, the second concerns the system of educational administration.

Swedish education is tightly controlled and directed by the central government, through the Ministry of Education and its twin administrative agencies, the National Board of Education and the Office of the Chancellor of the Universities.

School reform and innovation is, therefore, directed from the centre. The initiative is handed down through Parliament to the National Board of Education, which in turn must organise change and create the circumstances in which innovation takes place. The strong central control extends not only to matters of organisation and of 'quantitative' planning but also to the 'qualitative' planning of the school curriculum. The syllabus and study plan for each type of school is the direct responsibility of the central government. Commissions set up to carry through major changes in organisation have been expected to plan the whole programme of studies as well as the administrative changes which a new system of organisation might entail.

It so happens that a part of the reform is intended to introduce a greater degree of decentralisation. Before the introduction of a comprehensive system, the elementary schools and the vocational schools were run by the local municipal authorities, while the secondary schools were State schools administered by the central government. The policy is to increase the powers of the local authorities - which now have been given responsibilities for the comprehensive schools and the secondary schools - without forfeiting the even standards of school provision which are claimed to be the consequence of centralisation.

In addition to the local authorities there is also a layer of 'decentralised central government' based on the 24 administrative county units whose general functions include the appointment of teachers for the 9 year comprehensive school and in-service training. These county boards of education are further responsible for the planning and co-ordination of education in the different municipalities.(1)

It can be seen that, with some 900 local authorities in a population of less than 8 million, many of the local bodies are very small indeed, their chief officers being local head teachers. At the other extreme is the local authority for the City of Stockholm with a population of 800,000 and a director of education supported by a strong professional staff.

While, therefore, the policy of decentralisation has already begun to have some effect - and some of the large authorities are, themselves, centres of innovation - the fact remains that the Swedish strategy is firmly founded on a strong central authority directing, and if necessary imposing change at the will of Parliament. If the word 'impose' carries extreme overtones, all that is intended is to clarify the source and the authority for innovation which is undoubtedly located in the agencies of the central government.

It is this centralisation which has ensured that from the outset matters of internal school management such as streaming and differentiation have been considered alongside larger questions of organisation. Similarly, responsibility at the centre for the

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planning of the curriculum means responsibility also for teaching methods. Where, in some systems, these matters might have been left to the discretion of local authorities or to the teachers themselves, Swedish centralism requires that they be considered as a whole and at the centre.

It would be wrong, in stressing this aspect of Swedish educational administration, to imply an authoritarianism which does not exist. But there is no doubt about where authority lies, nor yet is there any reason to doubt that this is an important (and possibly a somewhat corrosive) element in the relations between teachers and administrators. It also forces the innovators to employ fairly rigid techniques where they might prefer to act in a more flexible way.

The Teaching Profession

Any strategy for innovation within an educational system must take account of the teachers who already staff the schools. Here Sweden is in the remarkably fortunate position of having a good supply of well qualified teachers, enjoying high prestige and relatively high salaries in a community which recognises the value of education.

The educational system has rapidly moved out of a situation in which there were too few teachers into one in which there is now something like a balance between supply and demand. Class sizes in the comprehensive schools assume not more than 30 children to a class except for the first year (the seven-year olds) where the maximum permitted number is 25. The teacher pupil ratio is, of course, much more favourable than this - about 1:15 in the comprehensive schools and 1:13 in the secondary schools.

The class teachers - those teaching in the first six grades of the comprehensive schools (ages 7 to 13) - receive a two and a half or three year training at colleges of education. Subject specialists for the upper forms of the comprehensive schools and the secondary schools have a university degree followed by a year's teacher training. A second degree is normally required for senior posts in the upper secondary schools. The differences in the education and training of teachers are reflected in their professional associations, their salary scales and to a large extent in their attitude towards the educational reform.

The combined effect of a strong political will and a strong central administration may have contributed somewhat to the alienation of certain sections of the teaching profession, particularly 'subject specialists' in the upper forms of the comprehensive schools and the gymnasia. On the other hand, new organisation, new curriculum and new methods have been pressed upon them from above, some of which have demanded changes in their conditions of service as well as their pedagogic technique. Moreover, the very nature of the political basis of the reform has meant that any groups who opposed aspects of the change - for whatever reason - have tended to be branded as conservative, if not reactionary. None of this is surprising - if the educational reform is indeed part of a social revolution, a certain amount of ideological pressure is to be expected. But it certainly increases the importance of in-service training (of which more later) and, it could be that it does little to sharpen the self-critical

faculties of those who are most committed to the reforms, and who have been chosen for that reason to carry them out.

This could all become of greater importance as the Swedish system moves forward from the heroic period of radical reform, when major steps forward were initiated by Royal Commission leading to legislation, into a period of 'rolling reform' in which the pressure for innovation is expected to come from within the educational system.

It will be seen, then, that each of these three aspects of the Swedish educational scene - the political commitment, the centralised administration and the large and highly qualified teaching profession - contributes positively and negatively to the process of innovation. The political foundation is essential: yet the very strength of political will necessary to carry out long term reform can set up its own orthodoxy which may not always be conducive to innovation. The centralised administration provides an efficient instrument for organising change. But so far this has been a means of introducing innovation from on top, with the limitations which this implies in respect of the professional self-confidence and inspiration of the teachers. The highly qualified teaching profession makes possible high standards and ambitious policies which would not be open to a system with overlarge classes and undertrained staff. But this, too, can be a limitation on innovation: if radical change is needed which alters the whole role of the teacher, the presence of a powerful cadre of traditionally minded professional men and women is not going to be an unmixed blessing.

PART II

INNOVATION STRATEGY

The basic strategy of Swedish educational innovation assumes

1. Clear political decisions on the goals of the educational system and the objectives to be achieved in each type of school. These major political decisions have, on the whole, been taken on the advice of Royal Commissions on the basis of which the Minister of Education formulates legislation for Parliament.

2. The refinement of these general goals and objectives into a working curriculum and study plan for each type of school.

3. A programme of in-service training for teachers to assist the introduction of new curricula and teaching methods.

4. A programme of Research and Development to support the policies of reform and innovation.

5. A system of continual revision by which the curriculum and study plan for each type of school is constantly assessed in terms of its own objectives.

Aims and Objectives

According to the Swedish Schools Act of 1962, the general aim of the schools system is 'to impart knowledge to the pupils and train their ability and also, in collaboration with the homes, to promote the development of the pupils to become harmonious persons and active citizens aware of their responsibilities'.

These broad aims apply particularly to the comprehensive schools or compulsory schools taking pupils from the age of 7 to 16 through the first nine years of schooling. But they also apply to the secondary schools and are taken as the point of departure for the Syllabus and Study Plan manual (Läroplan) for the new gymnasium.

This general expression of the individual and social aims of the educational system has been expanded and made more specific by the policies and statements of Ministers and educational leaders. As Swedish techniques of innovation are directly linked to the establishment of objectives and the systematic planning needed to achieve them, it may be helpful to summarise the five main objectives of the Swedish educational system, as set out in the OECD publication entitled Educational Policy and Planning in Sweden (1967).

Objective 1. This relates to equal opportunity for public education without regard to income, social origin, sex or place of residence. It also recognises that while opportunity should be universal, individual talents differ, and that the aim of the school system should be to meet the differentiated needs of various groups

of students. No one branch of education, however, 'should in itself be considered more worthy of esteem than another, the entire school system constituting a co-ordinated whole'.

Objective 2. This concerns the function of the school system to safeguard and strengthen the democratic system which depends on co-operation and tolerence. From this are derived certain sub-goals, a common core of learning in the comprehensive schools and the post-ponement of differentiation; group work and discussion methods; civic education; education which stimulates critical thinking.

Objective 3. The third set of objectives are directed towards general economic development - the preparation and training of skills in the light of national manpower needs. But this is subordinate to the individual and social objectives summed up in the first two objectives above.

Objective 4. This commits the educational system to be flexible in order to respond to changing social, individual and economic needs. From this, it follows that education must be broad enough to allow for new vocational needs which may develop and require individuals to change their occupation later on in life, and that premature specialisation and dead-end courses must be discouraged.

Objective 5. This has to do with the effective use of the educational system's limited human and material resources, by a commitment to 'rationalisation' and the pursuit of the most efficient way of using teachers and arranging learning systems.

An important part of the Swedish method of innovation has been based on the refinement of general aims of the educational system into specific objectives for teachers in schools. The setting of clear objectives has been used both as a means of changing the practice of the teachers, and also to provide criteria against which to evaluate the success of the innovatory process.

In this the Läroplan for each type of school plays an important part. This document, running to 500 closely printed pages, which has no counterpart in less centralised schools systems, lays down the syllabus, and study plan for the type of school in question. In addition to setting out the content of the courses to be covered and the number of hours to be devoted to each subject, it includes a long introductory section explaining and elaborating the objectives of the school and the recommended methods of instruction and internal organisation which are related to these objectives. Here is part of the Introduction: Goals and Principles to the Läroplan for the new gymnasium which came into operation in 1966.

"1. Comprehensive Schools - Gymnasium

"1.1. The purpose of the education of children and young people, provided by society, is to communicate knowledge and develop skills and, in collaboration with the home, encourage the development of the pupils into harmonious people and able, responsible members of society.

"This is the substance of the first paragraph of the new Education Act. It refers to all instruction provided by society

to children and young people, whether voluntary or compulsory. Thus it is valid for the gymnasium as well as for the comprehensive school.

"In the gymnasium, as in the comprehensive school, the work of the school will be focused on the individual pupil. The aim of the work of the school is to promote the all-round development of each pupil, to encourage the development of his personality and to make him a free, independent and harmonious being. The training which the school provides must be <u>individual</u> training. ..

individual is ... a fellow-creature and a citizen. He is a member of a family and of a circle of friends and acquaintances, and he is a member of society. ... Therefore the gymnasium, like the comprehensive school, must give social training. The social training provided by the school must lay the basis of, and develop, those qualities which will, in a period of rapid development, enable the pupils to support and strengthen the demoocratic principles of tolerance, co-operation and equality of sexes, nations and people. One of the principal aims of the social training which the school provides is to instil into the pupils respect for truth and justice, for the human dignity of all people, for inviolability of human life and thereby for the right to personal integrity. ...

"2. <u>Tasks of the Gymnasium</u>

"In the work of the gymnasium special attention should be given to the folowing:

"2.1. The instruction provided by the gymnasium is based on the nine-year comprehensive school. It must provide a foundation for further study at university level and other post-gymnasium education, and for immediate entry into the labour market.

"One principal element of the instruotion provided by the gymnasium is to develop an <u>independent</u> and <u>critical</u> attitude. The result may vary within wide limits, but from the very beginning the pupils should become accustomed to an inquiring attitude towards the knowledge and information offered them inside and outside the school, to check the correctness of information, the structure of arguments and the reliability of conclusion, and to make strict demands on intellectual honesty in their evaluations of others' information and in expressing their own views. ...

"A pupil should always be allowed, after independent consideration, to accept or reject a judgement. This implies that the demand for objectivity should be made a general rule for all instruction. ...

"In modern society <u>understanding of, interest in, and willingness to involve oneself in, other people's problems</u> are necessary complements to knowledge. Insight into human and civic situations is important for all those who, in their work, have to act as leaders, or co-operate in otherways with people, and influence other people's conditions. Work at school, as in the

"fields of science, administration and economic life, is based upon continuous co-operation between people. Collaboration in social, occupational, political and other groups demands the will to understand and to co-operate, even when opinions differ. Work at international level involves that people judge others on the basis of their own traditions, history and social life.

"By paying attention in its work to the personal development of the pupils, the gymnasium also satisfies the demand for social training. Such training, no more than individual development, cannot be separated from other activities in the gymnasium. Social training is intimately bound up with the whole work of the school. Different methods of work, such as group work or individual study, satisfy this demand just as well as do school and environmental practice, or special preparation for future tasks.

"2.2. An important task of the gymnasium is to develop further what the comprehensive school has taught the pupil in terms of general ability to communicate with others. A central task in this is to develop his linguistic skill. The ability to express oneself clearly and logically in one's own language, to formulate one's thoughts both verbally and in writing, must be developed. If it trains a great number of its citizens in the use of foreign languages, Sweden will be able to maintain and widen the contacts which further its cultural, technical, economic and social expansion. Skill in foreign languages is therefore necessary. ...

"Mathematics is one of the means of communication which have become increasingly important. Quantitative methods have gained ground also in studies in which formerly these methods were not employed. They have also gained a footing in economic life and in administration; this is especially true of statistics, which have become a valuable tool in making predictions, analyses of costs and work, and so on.

"The aim of the gymnasium, therefore, must be, over and above the foundation laid by the compulsory school, to develop the mathematical skills of the students.

"2.3. In order to satisfy the demand for preparation for future education, or occupation, the gymnasium must provide the special preparation which the individual may want and need. It is impossible, however, to allow each student to realise his interests. The personal aspirations and the demands of labour market and society must be brought into balance. To determine this balance, however, is not the task of the gymnasium. Therefore, there must be, in the curriculum and organisation of the school, possibilities of taking into account personal talents and interests, and of letting them guide the pupil towards a more or less individualised programme of studies. But even if divergences are allowed within the common framework, the result must not be that the individual pupils' study programmes differ too much from the demands made by the branch in which they will be working after school.

"In particular in the economic and technical streams, the special preparation the gymnasium offers must be planned carefully in view of the tasks the students will be confronted with in their working life. By its instruction, the gymnasium must offer students a preparation for the labour market, for many of them will, at the end of their gymnasium studies, go direct to economic life and administration.

"2.4. Society demands - besides certain special preparation and skills in communication - general knowledge and skills common to all or most people, a frame of reference in which important phenomena in society and culture can be placed, and which will facilitate contacts with and understanding of one's own and of other peoples's culture."

The Läroplan then goes on to discuss common core. The emphasis is strongly sociological. Social and economic geography and civics are needed to encourage a proper understanding of Scandinavia and other countries and peoples in Europe and in "the so-called under-developed countries with which relations are more and more intensified." With this goes an understanding of comparative religion and cultural differences. All also are required to have an introduction to science and technology, to history and art. Other aspects of the programme singled out for special mention include teaching about careers and education beyond the school stage and physical education. There follow comments on how pupils should be taught to carry out their work.

"2.5. It is one of the tasks of all types of school to develop the pupils' working habits. When they leave school, the pupils should be able to perform tasks which require a sense of responsibility, whether in their work or in connection with further education. For the gymnasium this means that its pupils, when they leave school, shall be accustomed to taking the initiative in planning and performing large tasks, independently or in co-operation with others. This includes the ability to collect the necessary information, to interpret and evaluate it, to plan their own work, and finally to assemble and report the results. The gymnasium must further develop the training in techniques and skills of studying and carrying out tasks with which a beginning was made in the comprehensive school. This implies also that the methods of studying in the gymnasium must be such that they help to develop the students' ability to make observations and to take the initiative, as well as to make independent judgements."

This general Introduction is then followed by a second section on 'General Principles' which describes in greater detail how the earlier-stated objectives may be reached in school organisation and instruction.

Among other things, it spells out ways of promoting co-operation between home and school; discusses the methods of consulting pupils through the school's 'students' advisory council'; draws attention to the importance of educational and vocational guidance; lays down principles for the options leading to higher education or employment. There is a lengthy section on 'teaching' which indicates the manner in which the teachers should prepare their courses and teaching materials.

Another section sets out to show how, by group work arranged in various ways, the curriculum can be made, in the official view, to contribute to the general aim of co-operation between pupils. Yet another concerns the objective of independent study, study training and guidance in study technique, on which great importance is placed. Marking is discussed at some length in view of a decision to end the formal student examination at the end of the gymnasium and to introduce a system of assessment over the whole gymnasium course designed to enable teachers to mark fairly from one end of the country to the other without recourse to external examinations except as a moderating technique.

The justification for quoting at this length from the Introduction of the Läroplan is the significance which the Swedish theory of innovation attaches to the statement of clear objectives. This is at the heart of the system. There is, of course, room for debate as to how clear the statement of objectives really is. Some of the objectives, inevitably, are in conflict with one another - or rather, a state of tension exists in which a series of not wholly compatible aims have to be held together in a working compromise. A statement of goals does not relieve the planners or the practitioners of the need to have priorities. All the objectives become priorities but some are higher in rank order than others, and to be a low priority comes to mean the same as being no priority at all.

Nevertheless, whether or not the statement of objectives is, or is not quite as sure a guide to action as, in theory, it should be, it serves its purpose because it is accepted at face value. It becomes a potent weapon in the hands of the planner, a blunt instrument with which to concentrate attention on the application of agreed policy.

The official position is that the Läroplan is only guidance for the teachers, prepared by the National Board of Education, which experienced practitioners in the schools may take and apply at their discretion. The study plan and syllabus, including the way in which the weekly hours of work are to be divided, is centrally determined (though local authorities are being given more marginal discretion). These have to be followed. But much of the scheme is written in general terms or provides options which allow the teacher considerable latitude and room for manoeuvre. And, although on matters of method and approach, the Läroplan represents the collective wisdom of practical teachers, inspectors and advisers, the teacher in the classroom is technically free to prefer his own methods, provided they are directed towards the overall goals of the plan.

The impression which a visitor to Sweden is likely to gain is that the National Board of Education may be tempted somewhat to overstate the importance and influence of this document which the teachers are at pains (for reasons of professional autonomy) to understate.

These differences of emphasis may not be unimportant in a consideration of techniques of innovation as great weight has been attached within the National Board of Education to the process of regular revision of the Läroplan.

Methods of Revision

This is organised within the National Board of Education in the department of general education (UA) where there are working groups and committees concerned with curriculum in each type of school. As soon as a new curriculum is brought into operation it is the task of the relevant group to set about the evaluation of the working of the curriculum in the light of the stated goals and to prepare proposals for revision.

These revisions have tended up to now to have been undertaken in conjunction with changes in organisation following the operations of a Royal Commission. The decision to introduce the new upper secondary school in 1971 in which the gymnasium, facksola and vocational schools are to be brought together, has necessitated a full scale revision of the curriculum.

Techniques by which the working groups within the National Board of Education have carried out the revision have varied, according to different types of school and different sections of the curriculum. One method has been to investigate the existing practice by the use of mixed reference groups - teachers, representatives of employers and employees and universities, inspectors, administrators, and often students themselves - and for the officials of the National Board of Education to move forward in the light of the recommendations of these bodies. According to circumstances varying weight might be attached to the subjective judgements of teachers and others, and to the more objective methods devised by social scientists in University and other research institutes.

Curriculum building has been undertaken within the National Board of Education, taking into account the availability of teaching materials on one hand and of the training and retraining of teachers on the other. The stages, however organised, have been, first, the investigation of how the schools are working - how closely they are following the study plan and how successfully they are working towards the stated objectives. This has meant evaluating not only the work of the teachers but also the study plan itself. To a pragmatic observer there appears to be a heavy reliance on the statement of abstract principle and the confident assertion on a priori grounds that particular practices in school will contribute (or ought to contribute) to the fulfilment of these abstract principles. Part of the work on the revision of the study plan must be to test whether the a priori reasoning has been borne out in practice.

Having evaluated the present practice, on the basis of reports from school inspectors and reference groups of teachers and teacher-consultants, the working group has then had to take into account any changes in demand - from the employers, trade unions, universities and from the pupils themselves, and any conclusions these consumers of education may have reached about the working of the existing curriculum.

New curricula have then been proposed which, without altering the objectives, have been judged to contribute more effectively to their achievement. This has been where the general suggestions have had to be translated into a study plan which could in turn be passed on to the teachers in the schools, and used as the basis for in-service training.

It is clear that there have been many differences in the way the actual curriculum building has been done in the past - in the amount of detailed planning which has been undertaken and in the extent of the field-testing which has been included. Different methods have been found to be appropriate for different types of schools and even for different subjects within the curriculum as can be seen, for instance in the revision of trade courses at the vocational school.

Training and Retraining of Teachers

Swedish educational innovators have clearly recognised the critical importance of training and retraining in any strategy of innovation. Spending by the National Board of Education under this heading rose from 1.14 million Sw. Kr. ($230,000) in 1960 to 31.62 million Sw. Kr. ($6.3 million) in 1969. Some 260 teacher-consultants are in service, working half-time as teachers and half-time as curriculum advisers with other teachers. It is estimated (1969) that some 10,000 teachers will take part in courses, most of them lasting a week but some extending to two or three weeks. In addition to the expenditure from central funds the local authorities spend about 10 million Sw. Kr. ($2 million) on local in-service training schemes.

During recent years there has been an attempt to promote more short courses and local teachers' study circles where specific curriculum questions can be studied with the aid of teaching materials specially prepared for the purpose.

In the Autumn of 1969, a major programme of re-training began in connection with the new curriculum to be introduced into the comprehensive schools in 1970. All head teachers in the country were to attend four-day courses, arranged on a regional basis. Similar study conferences were planned for the spring of 1970 for all teachers in the comprehensive schools - 55,000 of them. Teachers in the upper forms would attend for four days; those working in the lower three forms will only attend the first two days.

The new 1970 curriculum for the comprehensive school involved the extension of modern mathematics teaching and the introduction of English at the third grade. Both of these changes have involved special training for the teachers who have had to equip themselves for new tasks. Radio, television and correspondence courses are being used for this purpose. Altogether, the National Board of Education allocates about 2 million Sw. Kr. ($400,000) to the planning and production of study material for in-service training. It will be seen that, even leaving aside the special programme for the introduction of a new comprehensive school curriculum, the scale of the in-service training effort is considerable, with about one teacher in 10 attending summer courses of from one to three weeks and an estimated 80,000 teachers taking part in up to five obligatory study days each

year when the schools can be closed while the teachers work.

In-service training and retraining is held to be important for two separate reasons: first, as a means of introducing particular changes in organisation, curriculum and method; and second, as a means of building up the professional self-confidence and commitment of the teachers.

The inertia of the teaching profession is one of the restraints which any concerted attempt to promote innovation must tackle. This is true in Sweden as elsewhere. It is ironical, perhaps, that in Sweden, where the comprehensive principle has most wholeheartedly been adopted, the teachers are themselves fairly sharply divided by type of training, school function, salary scale and professional association. The teachers' unions belong to different trade union groups, which adds to the divisions.

The Swedish authorities have recognised that the introduction of new methods make heavy demands on the teachers. Even with the volume of in-service training which is now undertaken there are complaints from the teachers that not enough is being done to train them in the use of new materials and methods and that the changes they have to face are not being taken into account. Often these changes are subtle, affecting the teaching craft itself, the teacher's feeling of security in his mastery of the craft and the satisfaction which he derives from his work. A part of the training and retraining programme has to be directed at eliminating the fears of teachers on these grounds and building up their confidence and competence in handling new techniques.

Much of the training programme concerns the individualisation of instruction - a concept which any visitor to Sweden soon encounters (and to which reference is made later). Individualisation is one of the primary objectives of the system. ('the work of the school will be focused on the individual pupil ...'). What makes it a matter of day to day concern, however, is the determination to postpone differentiation, streaming and selection to the latest possible stage, and to keep as much of the curriculum as possible common to all pupils throughout the compulsory school from 7 to 16. Even if the centrality of the individual were not stressed as clearly as it is in the stated objectives the practical tasks of teaching in an unstreamed group might be expected to place this in a prominent position. Unless the teachers can be shown effective methods of individualising instruction for a teaching group of 25-30 children of widely differing ability, those who have been accustomed formerly to teaching selected groups are likely to be frustrated by what seems to them the reduced effectiveness of formal class teaching and the consequently lower satisfaction which they will derive from the job.

Some of the pressure for retraining has come from complaints of this kind. Teachers who have not discovered how to provide individually for their ablest and least able pupils within the same teaching group, have encountered discipline problems. The theoretical answer to this has been to advocate a more active and interesting classroom and school environment in which disciplinary difficulties would disappear when all children were individually at full stretch. Hence the emphasis on group methods and on teaching aids, and, above all, on such individualised instructional systems as are becoming available.

The most important and advanced of the individualised instructional systems now coming into use - IMU mathematics - is described in a later section of this report. From the teachers' point of view the question which is likely to arise is whether there is any conflict between the co-operative goals of the school and the pedagogic necessity to individualise instruction. As yet this remains an academic question, though one of which teachers and administrators alike are well aware. The more extensively the curriculum were to be individualised, the more acutely this could bear upon the schools.

Rolling Reform

As already mentioned, Swedish educational administrators believe that the educational system should now move forward into a new phase of development in which curriculum reform should be a permanent, self-renewing condition. On this reasoning, innovation becomes a state of mind and an administrative attitude, not something more or less traumatic which requires a Royal Commission to carry it through.

Royal Commissions, of course, will continue to be used where appropriate. One of the features of the systematic approach to change which the Swedes have adopted has been that reform has been co-ordinated and efforts have been made to ensure that the separate parts of the system are prepared for the consequences of changes in any one part. A Commission is still likely to prove useful where structural changes are needed. Among Commissions now working in the educational field is a major inquiry into the organisation of post-secondary education which is studying the changes which will be required in the light of the explosion of numbers in secondary education and the consequential pressure on higher education. When it is said, therefore, that rolling reform will replace the more formal techniques of the Royal Commission, this mainly concerns matters of curriculum and methods.

Two main reasons are given for the need for 'rolling reform'. The first is that society and human knowledge are changing so fast that any system which remains static soons becomes out of date. The second is that the educational system must constantly seek to innovate in order to rationalise: it must always be under the same pressure as any other large scale enterprise so as to be able to use its human and material resources to the best possible advantage.

A policy of rolling reform means seeking ways of systematising the present processes of revision, relying less on the estimates of teachers and others, and more on the social scientists. Plans are already in hand now(1) for the revision and evaluation of the new gymnasium curriculum. This is known as the LAG project. Some of the thinking behind rolling curriculum reform is set out in a paper on 'Principles for the further revision of the Swedish gymnasium and and continuation school curricula' dated 28th June, 1968. This is specifically concerned with the secondary schools' curriculum. The techniques under discussion, however, apply to curriculum renewal generally.

Rolling reform does not mean allowing reform to take place on the initiative of the teachers themselves. "The fact that the Board of Education will in the future play a primary role in the school planning /in contrast to ad hoc Commissions/ should not mean that questions of

(1) Summer 1969.

method are to be attacked solely by teacher-steered reforms. On the contrary, we should strive to develop planning methods with a view to covering the relevant problems more completely and achieving an improved optimal technique in step with development in the social sciences. ...

"A self-evident aspect of revision is that of rationalisation. Every change must be a gain and the results must be reflected in more efficient teaching.

"The principles laid down for this 'rolling reform' ... should provide a pliable instrument for the continuous renewal of a system previously characterised by a high degree of inertia ...

"We must try quickly to obtain an overall picture of how the new system is functioning in relation to the educational aims established with the decision of Parliament in 1964. The object here is to locate the greatest faults and establish where the greatest difficulties are encountered. This, if possible, should be done in such terms as permit the ranking of different problems in priority order. The 'problem sectors' involved can be of various kinds: specific systems of materials or methods, new text books and other materials, more concrete recommendations, administrative measures in respect of joint classes and other forms of grouping, questions relating to in-service training and teaching qualifications, alterations to the time-table and, of course, changes in the actual aims of teaching. If the target set proves to have been too ambitious then it must be lowered; if it is achieved with a wide margin, then we must either alter the target or reduce the time allotted.

"The object must be to illustrate the situation of different subjects as thoroughly and objectively as possible: this can be achieved partly by objective tests of the students' knowledge, but it is at least as important to try to attack the problem in the actual teaching process, e.g. by surveys among teachers and students with other methods. We are, as yet, at too early a stage in the discussion to say whether this should be by interviews, questionnaires, the critical incident method, or similar. ... Such studies could now be of great use, before any less desirable teaching methods and material become firmly established, and before teachers and students can accuse the Board of Education of coming too late. As regards the technical design, it should be possible in the initial stages at least, and under certain conditions, to make use of gymnasium inspectors and consultants in the collection of information. However, it is very important that the work of reform be clarified from the beginning in collaboration with the institution or institutions that are to participate by performing studies."

Central to this approach to curriculum renewal is a close study of the internal function of the school and the teaching process itself. Here, 'the emphasis must be on these important variables, namely: time, principal subject matter, and method'.

The paper continues: "For internal function analysis to give reliable results, it is necessary that general planning models be scientifically evolved for teaching in different subjects. It is

"important also to construct easily used tools to measure, for instance, student attitudes to teaching in different subjects. It is of particular importance to be able to chart how the new forms of work introduced in the gymnasium and continuation school function in practice. To obtain the relevant data for a future analysis of the internal function of the curricula, more consistent planning and application of the curricula will be necessary. This will take the form of local studies at specific schools. ...

"The object is to let each school handle the investigation of a particular line or sub-alternative. ... It is also intended that the working groups at these schools should structure the content of certain subject curricula, so that a study schedule can then be built up in which such aspects as co-ordination, methods and aids are considered in more detail. In this way, the aims of the curriculum can be 'tuned' to the right level.

"The results of such activities will then be presented as a basis for further analyses of the internal function of curricula.

"It is important that the Board of Education penetrate from the very beginning the different functions of the project, and give it a general design that will cater satisfactorily for the demand for topicality, by developing methods of work that make continuous allowances for the requirements of recipients, and of society at large. Experience of planning during the last year suggests an increasing emphasis on the development of new methods in work on the curriculum. ...

"The intention is primarily to evolve certain routine procedures in the different functions of curricula work, to meet the requirements for periodicity. Even if the Board of Education, through its gymnasium inspectors and school consultants, has the means to follow the introductory phase of the new gymnasium and continuation school in some detail, it would be unreasonable to see this as the only instrument for a thorough analysis of all phases and tendencies during the introductory period. And to base future changes solely on the experience of the Board's officers would be to underestimate the actual renewal taking place among teachers 'out in the field'. More methodical analysis, and a better way of channelling the flow of information, is very necessary. We can say quite generally that the demand for rapid changes in the curriculum will increase, owing largely to the increasing mobility of the labour market, and this alone necessitates and warrants a real effort to make work on the curricula pliable. ...

"The demand for 'currency' can be met also by the Board of Education, in accordance with the directive of the Minister, keeping in contact with various reference groups, such as the associations in different subjects, trade organisations etc. To maintain continuous contact with such reference groups is an essential aspect of work on the curricula.

"To meet the requirements of recipients and society at large within the framework of the project, it is necessary to continue with the methods of study applied on a limited scale by the

Gymnasium Commission. It is possible, for instance, within the Board of Education, with the help of the gymnasium inspectors and other officers, to make quick, practical inquiries in order to chart the problems that arise, and also to make larger-scale studies among employers, e.g. in respect of how continuation school students are adjusting to the labour market. ... In this way, the requirements of subsequent employers can influence the design of curricula more directly...

"A principle in planning the project has been that those engaged in the different parts of it shall devote themselves mainly only to their particular sector.

"In planning the project, it was thus considered unsuitable that those engaged in, say, analysis, should at the same time be called on to assess the proposals presented for a new curriculum. The different ingredients of the project break down into what we can call an analysis function, a construction function, and field tests. Other important aspects include consultation with research."

The author goes on to discuss how, when the process of analysis has been completed the actual work of curriculum construction begins. The approach which he outlines is that developed at the University of Gothenburg by Dr. Urban Dahloff and Dr. Erik Wallin in connection with their studies in educational technology.

"On the basis of the material emerging in analysis, the leading curriculum shall give such directives that temporarily engaged experts are able fairly easily, and above all quickly, to produce proposals for a new curriculum in their subject. Secondly, on the basis of what the experts produce, the constructors are to provide a foundation for any experimental activities ... which will then be evaluated by the constructors, and furnish the basis for a final decision on changes in the curriculum. ...

"Changes in the requirements of recipients, and of society at large, will also be channelled through the construction group. With their capacity for goal-analysis ... this group will be able, in the reconstruction of curricula, to exploit innovations suggested not only by life in the schools but also by more general considerations of educational policy. ...

"Owing to the great effort made on the analysis side of the project, the space devoted to field tests has been reduced. The term 'experimental activities' has consciously been dropped in this context. It is intended that the trials held in the future within the project will really be 'field tests' of a given proposal. Such a proposal will in a way already have been tested, in so far as it is the result of very careful analysis, after which it will have been goal-analysed and evaluated by experts in educational technology. For this reason it is intended only to make isolated field tests, and the costs of this should be relatively low."

Not only does this approach rest on models formulated at Gothenburg, it is also being carried out in close co-operation with the university's Institute of Education.(1) Several members of the staff of the National Board of Education who are involved in the LAG project have joined the Gothenburg course in educational technology which has been set up with support from the Board's Research and Development Funds. These include Mr. Cervall, who leads the project.

As will be seen from the diagram showing the system model of educational technology developed in connection with the Gothenburg course (see p. 30) the approach is sophisticated and theoretical, with great emphasis on goal analysis. It covers both the general planning of educational systems and the planning of instruction - in other words it looks at both large-scale and small-scale questions. "Instruction might be defined as goal-directed and systematic modification of behaviour." The goals, principals and dimensions of education, obtained as a product of community planning, must be broken down step by step to be transferred by way of instruction to desired changes in the behaviour of the members of society.

> "Not least the development in programmed and so-called pre-produced instruction has given rise to radically changed views on such questions as defining objectives, steering and controlling the quality of instruction. The whole of this process, from the analyses made by the educational planner on the macro level to the construction of the shortest instructional sequence must be well synchronised. We have chosen to call that part of education concerned with the application and development of methods to effectuate this development process 'Educational Technology'. It should already be clear that this field of work has become so comprehensive that a differentiation of the functions can be discerned. The first phases of this process seem to coincide well with the concept of Educational Planning, while the others correspond most closely to what we mean when we speak of Instructional Planning and Instructional Technology.
>
> "The boundary between Educational Planning and the Instructional Planning is often diffused, as these terms are applied to parts of the same process.
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> "It was on this background that the Institute of Education deemed it urgent to start a university course in Educational Technology. This new course satisfies a great need which is obviously present and also prepares the way for a more comprehensive and systematic view of problems of education and instruction, as hinted above. For several reasons, Educational Planning has been given less scope than Instructional Technology. The course is intended for the growing group of people who, in various ways, are engaged in or will become engaged in one way or another in planning, construction, administration and evaluation of education and training in the public educational system and in the commercial

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(1) As it happens, however, the theoretical work by Dr. Dahlhoff on which the working model is based was not financed by the National Board but by funds from the National Bank's Jubilee Fund.

"and industrial sector, as well as in national and local government, different forms of adult education and so on.(1)"

The course is mainly for educational administrators, curriculum experts and industrial training officers and to fit in with their employment it has been arranged in eight units each lasting a week. The intervals between these units are devoted to reading and practical work on the systems in which they are currently employed. The practical work is regarded as of great importance.

Another Gothenburg project - COMPASS (Comparative Analyses of Objectives and Processes in School Systems) - is playing an important part in the LAG exercise. In order to assess the extent to which existing courses fulfil the aims which the curriculum has been given, Dr. Dahlhoff is carrying out an investigation in the Gothenburg Secondary schools. His great concern is with the actual process of teaching which in his view has been often overlooked in discussions of organisation, intelligence and so on. He has shown, for instance, that general statements about streaming or non-streaming are unlikely to be meaningful unless the actual teaching process is considered in detail as well as the overall organisation.

In the COMPASS project, five subjects in grade 2 of the gymnasium are being closely examined. Four times a year information is collected from the pupils and the staff to establish

1. What the classes are dealing with at the time of inquiry.
2. By what methods.
3. What they have been doing since the beginning of the term.
4. What problems they have come up with.

The inquiry goes on to cover teachers' plans for the next period, pupils' attitudes towards methods, subjects, teachers and their school work in general, and the pupils' marks and results in standardised tests. (See Chart p. 36)

Research and Development

It will be seen that the method of curriculum reform outlined in the LAG paper relies heavily on research and development and on the assistance of experts in the social sciences from the universities and teachers' colleges.

It takes a resolutely optimistic view of the extent to which curriculum planning can be placed on a scientific basis. In the confidence it reposes in the social scientists it reflects the efforts made throughout the planning of the Swedish school reforms to build research into the programme at every stage. Most of the Royal

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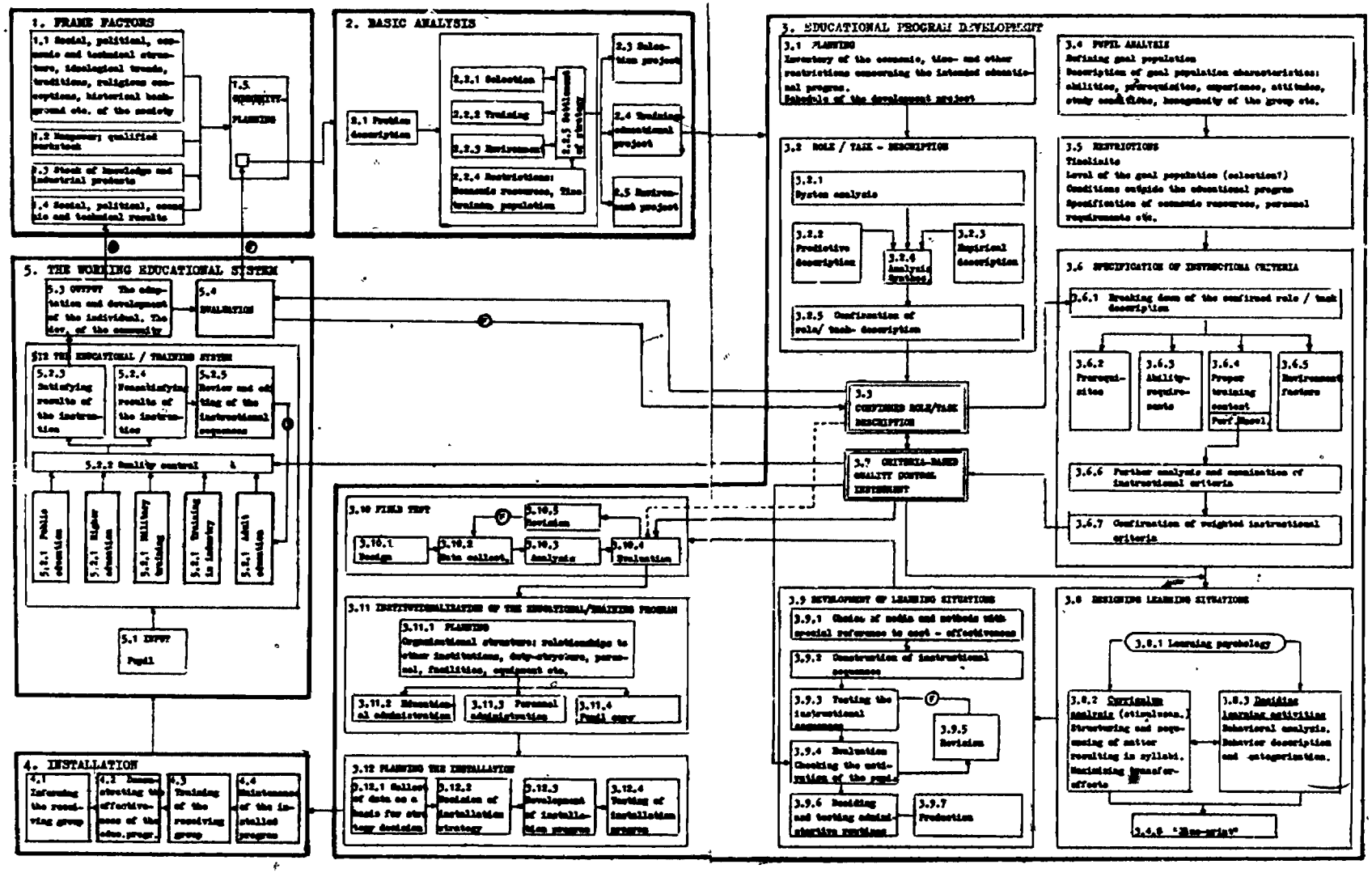
(1) From School Research Newsletter - 1968: 1, Planning and construction of a university course in Educational Technology, National Board of Education, Stockholm, Sweden.

A SYSTEM MODEL OF EDUCATIONAL TECHNOLOGY



Bo Eriksson, Department of Education, University of Göteborg, Sweden

Commissions, which planned the different phases of the reform of the educational system, incorporated programmes of educational and social research. Swedish politicians and administrators have gone further than their counterparts in most other countries to form close links between the research workers and the decision-makers.

In 1962 a new bureau - known as L4 - was formed in the National Board of Education to plan and supervise educational research and development. 'R and D' funds allocated through L4 now amount to about 10 million Sw. Kr. ($2 million) a year, having risen steeply within the last few years from an original figure of about 2 million Sw. Kr. ($400,000).

L4 is a small unit led (at the time of writing: 1969) by Nils-Eric Svensson and Eskil Bjorklund. It does not undertake any direct research itself. Instead, it plans the distribution of NBE research and development funds mainly to universities and research institutes. As these funds represent the overwhelming preponderance of the money available for educational research and development, its influence is obvious.

According to Professor Harry Passow of Teachers' College, Columbia University, who recently carried out a survey of Swedish educational research activities and the part played by Bureau L4, (1968), the Bureau "appears to have a web of close relationships with the various research institutes wherein the research and development work is actually undertaken, with the functioning bureaux and offices of the National Board of Education, with the Ministry and its Commissions, with practitioners in the field, with publishers and materials producers, and with other research founding agencies such as the Social Science Research Council. When direct access to the Director General of the NBE is added and when one considers that basically Bureau L4 is two individuals, the growth of this bureau's influence becomes even more significant. Quite clearly, Bureau L4 is not in business to distribute mimeographed research reports, rather, it views its mission as contributing directly to the determination of educational policy and to decision-making.(1)"

There are two ways in which projects are chosen for support. In many cases the initiative comes from the university or the research institutes. L4 is likely to back a promisiong project which offers itself. The network of informal relationships is such that the Bureau is likely to be able to keep well informed about up-and-coming people and ideas worth supporting. Many of the likely project leaders are themselves in consultation with other branches of the National Board of Education and there is a free flow of information about on-going curriculum reform and innovation which keeps the research workers in touch with thinking inside the National Board.

In other cases, the Bureau will 'solicit' proposals when it has a clear demand for a particular kind of work to be undertaken in connection with some work within the Board. It is obvious that there

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(1) Bureau L4 and Educational Research and Planning in Sweden. A. Harry Passow, NBE School Research Newsletter, 1968:9.

It is obvious that there will be many occasions when a project takes shape by a combination of these two methods.

To assist in weighing up the projects which are put forward, the Bureau has the assistance of an advisory Committee and a Consulting Committee, the latter body consisting of the heads of the various research institutes plus a number of influential co-opted members, being the more important in determining policy. According to Professor Passow,

> "Since all of the research and development is actually undertaken at the research institutes, the heads are directly involved in the preparation of the budget, in the determination of which problem areas will be tackled, and to a certain extent, where projects will be placed. True, this is done in an advisory capacity but it does represent a relationship between the Bureau L4 and its project-operating institutes which is quite unique. In the context of the Swedish system, this appears to be a positive relationship and may help short circuit the delay in developing, funding and implementing proposals."

L4 has the responsibility for providing a policy framework within which the National Board can support research and development, strong enough to yield the positive advantages of coherence and co-operation, yet not so intrusive as to impose any kind of stultifying uniformity. It has, as it were, to orchestrate the themes which emerge from the independent activities of original minds in the universities and institutes, in harmony with those which come out of the practical activities of the National Board. While it is clearly not possible to draw a hard and fast line between pure and applied research in education, the general assumption is that to be eligible for support from L4, a project should be directed towards solving questions fairly directly related to the needs of the schools.

In addition to the support of work at universities and research institutes, money is also channelled into less obvious social science-based development projects such as those already undertaken by the National Board of Education in connection with curriculum reform. These include the new 'development groups' set up by a few local authorities, among them Malmö (see p. 38). So far this local activity is on a very small scale but may be expected to grow considerably if the early experiments prove successful.

Systems Approach

As more funds have become available since 1964 the policy of NBE has been to concentrate research and development efforts on the process of instruction and in particular to develop a systems approach to curriculum development. This has meant giving support to projects using a Methods-Materials-Systems approach. Much of this work bears on the individualisation of instruction which is seen as one of the central problems in the development of mass education at the primary and secondary stages.

It is the National Board of Education's expressed intent to "improve the school by systematising and instrumentalising the instructional approach." It aims at designing "prototypes for

"instructional systems and at the same time to develop, in so far as possible, models for more and more production-oriented research and development."

In a memorandum on the development plans for 1968-69, the National Board of Education wrote at some length about the direction of the development work which it was intended to support and shows how heavily committed it is to the instructional systems approach.

The memorandum stated(1): "Naturally, the steps taken to reform our schools depend largely on the views we hold about what is actually meant by instruction. The traditional view - which is now beginning to be questioned - implies that the main role of the teacher is to transmit information. Concepts like class and lesson are fundamental for our present instruction model. The task of the teacher is conceived as to organise the pupils' learning mainly by giving lessons (class instruction).

> "In Sweden the teacher's work is usually defined as equivalent to a certain number of lessons including preparations (teaching duties). One of the disadvantages of this way of measuring a teacher's work is that it may easily give the impression that the most important thing is to give lessons, that the task is to communicate a certain - both informative and character training - message and that, if this is done conscientiously, it cannot be helped if some pupils fail to acquire knowledge or learn skills as well as might be wished.
>
> "The unit, the building block, according to this traditional instruction model, is the lesson, a period of instruction led by a teacher. The class-and-teacher thinking, however, leads to difficult, laborious forms of work; the teacher has a rule always to take the whole class or group into consideration. The demand for the individualisation of instruction within the framework of the class will usually be difficult to satisfy. This model does not pay sufficient attention to the fact that the fundamental point in instruction must be the learning activities of the individual pupils.
>
> "The class and lesson model means that the planning of instruction is largely the responsibility of each individual teacher. Each class works during each lesson according to the plans made for that lesson by the teacher of the class. For most teachers and pupils this can hardly give the desired quality and the desired differentiation. The class and lesson as a planning unit must therefore be regarded as being both too large and too small. The planning of instruction should be directed to the activities of the individual pupils. In order to make this possible it is necessary to make use of more resources than are available with the class as a planning unit. The planning must therefore be done in a wider frame of reference than the class.
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> "What will an alternative instruction model look like? Experience of research and development ... suggests the following, perhaps slightly exaggerated, comparison between two instruction models.

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(1) Educational Research and Development in Sweden. Plans for 1968-69. NBE School Research Newsletter, 1967:2.

Instruction Models

Aspect	Present Model	Alternative Model
Planning unit	Class; lesson	Pupil, groups of pupils; larger sections of courses
Integration, systematization, planning	Mainly by the individual teacher; often not best combinations of media; often great qualitative differences	Largely already at the construction stage; systematically tested combinations of media; effects of use predictable
Construction of instructional material	Usually only textbook; without systematic production and testing	Instruction systems; systematic construction and testing
Teacher function	Primarily information communicator	Primarily tutor, "stimulator", work leader
Personnel structure	One teacher per class/group and lesson, with sole responsibility	Teams of teachers, e.g. with senior masters, teachers, assistants, etc.
Realization of changes	Often slow, with uncertain effect	May, in principle, be more rapid and certain
Individualization	Usually little	May be made as comprehensive as desired
Pupil activity	Often little (except for homework)	Great (study work in school)
Learning effect	Varying, difficult to measure	Each pupil's progress may be followed continuously

"In the opinion of the NBE, one of the principal aims of the educational reform work is to develop and test the alternative model of instruction. This model is expressed here in general terms. It is, of course, much easier said than done to change school instruction in the way that is outlined here. If - or more correctly, perhaps, to what extent - this can be realised, depends, naturally, on how far we are prepared to devote our resources to endeavours in this direction.

"On principle it is possible to construct instructional systems of the type outlined here for a school subject or group of subjects or for a certain part thereof and for a number of annual courses or parts of such courses. In such a case the content and forms of work are defined and ordered to make a well-planned system. Strict programming, in the accepted sense of the term, of pupil activities cannot be considered except in very limited sectors, e.g. training skills. The system must be flexible and aim in the first place at creating methods by which pupils can work independently, alone and in groups alternatively. The scope for group work, discussion, lectures, laboratory work, demonstrations and other 'social' situations, etc., is made within the given framework as large as is considered necessary in each individual case. The work of construction is extensive: the purpose is to arrive at a system in which the work of pupils, teachers and other personnel, and the utilisation of material resources of different kinds (media combinations) best serve the various functions of instruction (e.g. motivation, planning, presentation, directing attention, problem solving, feed-back and evaluation).

"The task of the teacher will be mainly that of a tutor, 'stimulator', and, to a certain extent, the governing, responsible administrator. The communication of information will be by way of the different learning arrangements included in the instructional system. In principle this will allow for a large measure of individualisation, and it will thereby create scope for a strengthening of the relation between the teacher and the individual pupil, the teacher will have more opportunity of devoting himself to the most important educational tasks.

"Here instruction is planned to a great extent partly in the constructional stage, with a large number of interchangeable alternatives for different sections of a course, and partly in the different schools (in collaboration with senior masters, teachers, assistants and the pupils themselves).

"Since central parts of the courses will be tried in an experimental way so that their learning value can be determined, it may be possible to guarantee that certain goals, considered essential in the curriculum, can be attained by all pupils. ..."

The memorandum goes on to describe the stages in a project involving the development of teaching materials summarised in a simple flow chart:

Plan-ning	Pre-tests	Ana-lysis	Con-struc-tion	Field test-ing	Prod-uction	Train-ing	Use

"The fundamental point in a systems approach", the memorandum concludes, "is that all links in the chain of production are developed within the framework of the same project.

"The main thing is to create direct and easily accessible communication lines between the goal definitions of the curricula and the various media combinations and teacher contributions which facilitate the pupils' learning activities. All links in the chain must fit into each other, and stand up to the demands made: if a pupil does not learn what is required of him, it is the fault of the system, not of the pupil."

As already indicated, most of the research sponsored by the Board of Education through Bureau L4 is carried out at the research institutes in the Universities and teachers Colleges.

A short-list of projects now in hand is appended at the back of this report to give some impression of the range and character of the programme. The examples to which reference is made in this report are taken from Gothenburg and Malmö but these are, of course, only a small part of the total research effort.

Individualisation

The individualisation of instruction is the recurring theme. "One gains the impression that those projects which deal with the basic problems of individualising and differentiating instruction - whether in terms of diagnosing and analysing those differences or developing materials and methods for meeting them - are at the heart of the planning needed to realise the school reforms which have been promulgated over the last few years.(1)"

The outstanding example of this approach - quoted to a visitor wherever he goes - is the IMU Mathematics project at the School of Education, Malmö. The project was begun in 1963 and the materials are now being field-tested on a large number of schools.

So far the main emphasis has been on producing material for grades 7 to 9 in the comprehensive school (ages 13-16), but preliminary studies have also been carried out with younger and older children.

The decision to develop materials for this purpose originated in the National Board of Education shortly after evidence was received of work on programmed learning for mathematics in the United States in the early 1960s.

The project has four aims:

1. to draw up and test self-instructional teaching materials in mathematics,

2. to test suitable teaching methods for the use of the material,

3. to discover in what way the students should be grouped and the teachers used in order to obtain the maximum effect from the material and the method,

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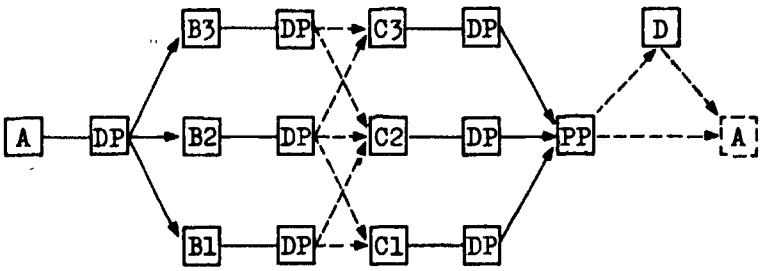
(1) Passow: op cit.

4. with the aid of the constructed material to measure the effects of entirely individualised instruction.

The project, in fact, combines three different types of innovation. First of all, it demands a review of the mathematics syllabus and the revision of the content in line with 'modern mathematics'. Second, it demands individualisation - the opportunity for pupils to work on their own, at their own pace. And third, it demands a new approach to the use of physical and human resources, new ways of using staff, flexible class sizes, and a new attitude on the part of teachers.

The material for the three school years of grades 7 to 9 is divided into nine sections known as modules. Each module provides work for a third of a school year, in the form of six to eight components - work-books of from 50 to 150 pages each. Each module, however, is provided at three levels of difficulty so that a pupil can move at the speed and degree of complexity suited to his ability.

The student is piloted through the course by a series of diagnostic tests taken after each component. Thus all take component A at the start of the course, which lasts three or four weeks. They then take a diagnostic test, on the basis of which they go on to component B at the appropriate level (B1, B2 or B3), and so on through the module. Switching from one level to another is quite frequent and the units of work are arranged in such a way as to facilitate this.



Sketch illustrating the principle of a module. DP = diagnostic test. PP = prognostic test. A in the frame on the extreme right marks the beginning of the next module.

The components each last about a month which means that the teachers have about 10 occasions a year to help students choose the right level of work for the next stage. "In this way and also because students are relegated at intervals to 'zero level' the difficulty level of the material to the students' actual performance and thereby reduce the risks of students being assigned once and for all to a particular level. Component D contains material for 'individual work', that is to say, more independent tasks. The better students choose one or more such tasks themselves and receive material and suggestions for the tasks which they will plan and carry out by themselves.

Reports on the tasks take place individually or in the form of a little 'tutorial' for those students who have chosen the same task.(1)"

The scheme offers, in effect, about 10 million permutations and combinations in the attempt to satisfy individual needs.

An unusual feature of the plan is a pamphlet for parents to help them understand what is happening and to introduce them to the new mathematics which their children are studying.

The material has now been under test since 1966 when the first version was tried out in a school with a small test group of 75 students. On the basis of this, the work-books were revised: all exercises with a 'solution frequency' of less than 80 per cent were changed or rejected. (This reflects the strong PL influence). Testing of the second version began in 1967 with a larger test group of 300 students.

The third version is now being tested in some 300 classes: 11,500 students are taking part, of whom some 2,000 are being investigated closely.

A visitor to a Malmö school where the material is being used would find these classes - 80-90 children - may be supervised by two teachers and one auxiliary (unqualified). (Other combinations of classes may be taken by other combinations of teachers and auxiliaries). A teaching group of 90 will be seated in a school dining hall or assembly hall. Each child will have his own assignment, periodically seeking assistance from one of the adults present. Some will be doing a revision exercise using small tape-recorders and earphones. Others will be doing diagnostic tests. A few will be sitting doing nothing, looking rather bored.

The team teaching approach and the big class organisation has been adopted for a number of reasons:

- students' work must be frequently checked and tested
- teachers have to keep careful notes on the progress of individual students
- there is a lot of material to cope with
- this means a lot of routine clerical work for which an unqualified assistant is eminently suitable
- "the majority of the teachers and some of the students considered that the students' motivation could be further stimulated if individual tasks could be replaced from time to time by group activities".

The organisation of staff and students in this pattern leads to financial savings. It is estimated that the money saved by the use

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(1) Some Facts About IMU, Hastad, Svensson and Oreberg, Department of Educational and Psychological Research, School of Education, Malmö, 1968.

of unqualified auxiliaries is sufficient to cover the extra costs of the expensive work-books - the cost of materials is about $20 a head, a year - and also making a real saving. This reflects partly the high level of teachers' salaries in Sweden and the differential between the teachers's pay and that of the assistant. The following description of how a typical lesson is prepared and conducted is from Some Facts About IMU by Hastad, Svensson and Oreberg.

"1. The lesson is prepared during a conference held by the teaching team to determine which tests will be held, what group instruction will take place, who is to be responsible for the group instruction, which material is to be distributed to which students, etc. The assistant takes notes throughout the conference.

"2. The group instruction, if any, is prepared by the teacher nominated.

"3. Before the lesson commences, the assistant produces all the material required.

"4. During the lesson the assistant is busy distributing and collecting material, supervising students carrying out diagnostic tests or solving problems, noting the students' progress through the course, the extent of their homework, checking their attendance and so on. The assistant should be sufficiently familiar with the material so as to be able to answer simple questions posed by the students. In general, however, she will refer the student to one of the teachers. Meanwhile, the teachers circulate among the students, helping those who have got stuck, seeing to it that the students work carefully and in accordance with the instructions laid down, giving the students encouragement and spurring them on, discussing the results of diagnostic tests, helping the students to choose suitable sections for revision, etc. One of the teachers may be busy on group instruction.

"5. After the lesson the assistant arranges all the material.

"6. Before the next conference the assistant corrects the students' diagnostic tests and enters up all the data on the students' progress, etc. The scope of the assistant's work is normally subject to local circumstances, but the following tasks are probably her most important ones.

" - To attend the lessons

" - To be responsible for the material

to ensure that the material is stored neatly so that it can be clearly surveyed

to select the material required before the lessons

to maintain a complete stock by making the necessary orders for replacement

" - To register the current work of the students

" the students' progress in their studies (once a week)

the students' homework (once a week)

results of the diagnostic tests

results of prognostic tests

booklets currently used by the students

" - To register student data

previous marks

test results

contacts with parents or guardians

" - To correct diagnostic tests

" - To copy out and make stencils of material produced by the teachers for group instruction

" - Clerical duties of various kinds, including keeping the minutes at conferences, notes on group instruction, notes on absence.

"7. At the next conference (a minimum of 1 conference per week per big class is necessary) the teaching team discuss their experiences, go through the results of the diagnostic tests, decide on measures to be taken following the results, for example individual revision or group instructions, survey the students' progress in their studies, decide whether any students require further encouragement, help, etc. The following questions are dealt with at the majority of conferences:

" - How far have the students progressed with their work? How much homework have they been doing? Do any students need special homework?

" - How have the diagnostic tests turned out? Which students need to revise their work?

" - Ought there to be group instruction next time? What type of group instruction? Who is to organise it?

" - Are there any students who have nearly completed their booklets? Which booklets should we recommend for their next phase?"

In addition to the IMU project there are others using similar techniques being carried out in the teaching of English and German.

No one who talks with Swedish officials about innovation can doubt that great store is set by these schemes. Although the IMU project has been carefully researched, it is too soon to evaluate it fully. Those most directly concerned with it tend to be more cautious in what they claim than the central administration, which seems at times to have

decided already that necessity demands that it shall live up to the hopes placed upon it.

It seems that this project, like others relying on programmed instruction through a single medium - and in this case, the printed page - makes considerable demands on the students' powers of perseverance. The pupils' interest is strongly stimulated at the outset. The curve rises, then it begins to fall. There is no doubt that it is daunting for a visitor to enter a classroom at 8.15 a.m. to be told that the 90 children sitting at their desks working at their assignments with more or less enthusiasm were starting a self-instructional lesson which would last for one hour and 40 minutes. It would become still more daunting if the rest of the curriculum were being similarly individualised.

This raised one of the minor conflicts between objectives which must arise quite frequently. The long, double period was the logical outcome of a policy laid down by the National Board of Education to improve the pupils' study technique and powers of independent work. Chopping the curriculum up into short periods, with time wasted in between is held to militate against sustained and purposeful study. But long periods of unbroken study may in themselves conflict with the aims of individualisation, if it proves difficult to sustain motivation for individual study on IMU lines for so long a period on end. It may be that the a priori reasoning in favour of longer periods of study is being challenged in this respect by experiment.

As to individualisation as such, it seems the IMU project has started from the premise that the work should be made as fully independent of the teacher as possible - the statement of aims uses the phrase 'entirely individualised instruction'. It must strike some observers as another paradox, that this attempt to go the whole distance in the direction of self-instruction should take place in a school system which is particularly well endowed with well qualified teachers. The explanation is not wholly economic, though the rational use of resources is recognised as of great importance. It is more likely to stem from the theoretical basis of the Methods-Materials-Systems approach which aims to make learning depend as little as possible on the intervention of the class teacher and as much as possible on the design of the 'super-teachers' responsible for the system as a whole.

It could be that this assumption is coming to be questioned, as experience challenges the attractive but essentially naïve belief that there can be a 'best' method of teaching which can be universalised through a 'best' set of structured, individualised teaching materials.

The interesting point of development may be the way in which the more active participation of the teachers is combined with the use of the new instructional materials - not only by general tutorial activity but from time to time in more orthodox forms of group teaching and activity.

The IMU project - as the prototype of the more ambitious attempts at individualisation - again underlines the need for the retraining of teachers. As the earlier quotation from Bjorklund and Svensson made clear (pp. 35-38) this goes to the heart of the matter. Individualisation presents a frontal challenge to the traditional role of the teacher.

"Good instruction has up to now been considered to be synonymous with good teachers. The teaching function rather than the learning function has been considered to be the essential factor in education. In the present development in this respect the emphasis is shifting towards an increased interest in the pupils learning activities. Accordingly, it becomes more and more accepted that the teaching ability is to be measured not by what the teacher does but by what happens to the student and how he ultimately performs. In addition, the requirement today is that the instruction should be individualised so that each pupil is given optimal possibilities for advancement in his school work from his own current level of knowledge and ability to higher levels. A general application of the ordinary class instruction conducted by the teacher from his desk is obviously neither efficient nor rational.(1)"

When asked about this - the size of the revolution in thinking which is demanded - Swedish administrators will point to the big programme of in-service training now undertaken (see p. 22) but concede that as yet the majority of teachers are unaware of the magnitude of the changes demanded. Some who have faced the challenge have responded to it with enthusiasm. Others have faced it and withdrawn to cultivate their traditional skills. But for the most part, even in Sweden, where the level of concern is high and the direction of advance is clear, it is still not difficult for most teachers to remain oblivious of what researchers mean when they talk about Methods-Materials-System.

If an unduly wide gap exists between the innovators and the practitioners, the limitations this must impose are obvious enough. According to some research workers it is also hindering research and development. Some teachers have become reluctant to answer questionnaires and supply information needed for research projects.

It is in this connection, perhaps, that work at the local level - teacher-led development which clearly has a low place in the hierarchy of innovation in Sweden - may come into its own.

Local Development Groups

One way in which the innovators have sought to spread the message of 'rolling reform' has been by setting up a small number of local development groups, based on some of the more progressive local authorities. Since 1964, Malmö has been one of these local authorities. Under the leadership of Mr. Lars Kjellman, the director of education, and his staff, the city has established a series of projects which include team teaching, the integration of social studies, experimental methods of study training and the use of other new teaching methods and teaching aids.

Valuable knowledge and experience is being gained about the practical applications of new ideas such as team teaching. A visitor to a Malmö comprehensive school may find these classes together in a lecture room watching a film strip and listening to a tape on a topic on current affairs. From this the classes will move to their own rooms with individual or group assignments. These will require them to use

(1) E. Bjorklund, Educational Innovation in Sweden, 1966.

the school library and resources centre, collecting stencilled working papers and, if necessary, drawing on further material on tape and film strip. At a later stage the groups will be reassembled to collate their separate activities and share their experiences.

The development work is focused on the main objectives laid down for the schools and is aimed at making a reality of the educational reform. Much of it is closely related to the retraining of teachers but because it is locally directed and teacher-led, it has certain advantages over other forms of in-service training. Having started in only a few schools, the scheme in Malmö has now been extended to all the city schools, in close co-operation with the Malmö School of Education.

Some 20 educational advisers are working in the Malmö comprehensive schools, spending part of their time as teachers and part as consultants for particular subjects or stages of education. The development groups are financed jointly by the municipality and the National Board of Education. It is beginning to be recognised that there will soon need to be a revision of the financial relationship between central and local government because the present central government grants, being directly linked to teachers' salaries, discourage local authorities from exploring more rational uses of resources.

One of the practical functions of the Development Group is to highlight technical restraints of this kind.

An incidental advantage of the local authority development group is that pedagogic experimentation may also lead to more adventurous administration in other respects - as for instance in the design of school buildings which both permit and encourage progressive teaching methods. This has been the experience at Malmö where new school building is reflecting new teaching methods, and in addition, is obtaining better value for money.

At this grass roots level there is a certain amount of reserve about the impact of 'innovation from on top' - the local administrators noticeably identify with the teachers rather than with the social scientists who inspire the central administration. There is a clear understanding that if you attempt to go too fast with innovation the process is self-defeating. This can be interpreted as a certain diffidence about the presentation of fully developed systems. Malmö is one of the places where IMU is being tried out, not without quiet resistance from conservative-minded teachers. At the local level there is far more likely to be an understanding that teachers need to be made to feel that they themselves are part of the innovatory process - "we must try all the time", someone observed, "to make the teachers feel this is something they are doing for themselves, not something coming from on top".

It is also in the localities that teachers and local authorities can talk and listen to each other - an essential element in radical innovation if teachers are to be convinced that new methods do not threaten their professionalism. It is not a question of rejecting systematised teaching materials, but it does suggest a preference for curriculum material which can serve, as someone put it, as bricks for the teacher to build with rather than a whole prefabricated structure.

PART III

CONCLUSION

Innovation in Swedish education is being organised with a skill and systematic efficiency which cannot fail to impress visitors from less highly organised communities. Any conclusions which are reached are therefore less in the form of criticisms or commendations than part of an attempt to identify some aspects of the Swedish educational scene which raise wider questions for others interested in the organisation of change in the educational system.

Objectives

This must be the starting point for any concluding discussion. The Swedish system relies heavily on the analysis of objectives. At successive stages from the education acts down to the detailed curriculum the relevant objectives are set down and policy is based on them. Within the technique of innovation itself there is a determination to use the methods of management by objectives. In everyday conversation with teachers, administrators and research workers it is common to hear people acknowledge that the setting of objectives is a political or quasi-political responsibility, separate from the executive functions of administration and teaching. In fact, the idea that the community can, through its political institutions, lay down the educational objectives and leave their interpretation to the school system, has been firmly and successfully instilled into the world of Swedish education.

The question which the outside observer must ask is whether reality altogether corresponds with this ideal.

It is fairly clear that in a society which has multiple aims, the aims of education are also bound to be varied, and, in all probability, conflicting. This seems to be illustrated in Sweden by the attempt to dedicate education to two separate objectives - the co-operative ideals of a society which would like to be more egalitarian, and the aims of individual development and self-fulfilment.

To point this out is not to indulge in sophistry or to play with words. It is to question whether the objectives are stated as clearly as they are conventionally believed to be. The directions in which they point, though not identical, are seldom diametrically opposed. What this means is that the way the objectives are interpreted is all-important, and to suppose otherwise would be to take an over-simple view.

Moreover, if it is acknowledged that in a plural society, there will always be inherent limitations on the extent to which clear objectives can be analysed and adopted, then it suggests that Swedish experience in this respect is more important for the myth which has been built - successfully - around it, than as an example of how to divide public and professional interests in educational innovation.

Of course, this makes it no less functional in the Swedish setting, though it suggests that sooner or later the incompatibility between individual and corporate objectives will have to be faced. At the present the assumption is that these can be reconciled by the schools in the way they interpret the official policy. This can still be done at this stage within the present framework. It is still possible to call on one policy (individualisation) to counter the pedagogic problems raised by the other (non-streaming, non-differentiation). What has still to be faced is the outcome of a really successful policy of individualisation, vis-à-vis the whole character of the school as such.

Centralisation

It is clear that the Swedes are feeling for ways of making their system less centralised, and among the reasons for this is a belief that this is necessary to release initiative at what may be called the grass roots level.

How Swedish centralism is regarded will depend - to some extent at least - on the eye of the beholder: both the present writers have experience of educational systems in which the power of decision and innovation is much more widely distributed. It is clear what the advantages of central control are. 'When father says "turn" we all turn'. The Swedish Ministry and Board of Education, staffed by skilled experts, is in a position to make things happen. The thoroughness with which the Swedish educational reform has been carried through is eloquent testimony to this. In a relatively small homogeneous country there are clearly limits beyond which it would make no sense to decentralise.

All this having been said, however, it is also easy to see the less favourable consequences of centralised control - particularly in regard to innovation in curriculum and teaching methods. The pressure to change comes from the top. The individual teacher is at the receiving end of a new orthodoxy rather than being encouraged to exploit the creative insights which he derives from his own teaching.

This is recognised by many Swedish administrators in Stockholm - who quote the local development groups (like that at Malmö referred to earlier) as evidence that the point is taken - but it may still be doubted whether in so closely controlled a system the full potential of local initiative and enthusiasm will be realised. This clearly has a direct relevance to the in-service training of teachers. If, as seems likely, this is at its most effective when linked with the active process of curriculum reform and the development of new teaching material, there is still a long way to go.

In Sweden, as elsewhere, innovation makes heavy demands on the teachers themselves who are more likely to embrace new ideas if they are actively participating as valued professionals. There is no reason to suppose that Swedish teachers are more stubborn in resisting change than other teachers, but any major change in educational policy is likely to leave many teachers unpersuaded and this has been the Swedish experience. When this lack of enthusiasm is institutionalised into a tension between the periphery and the centre, it assumes another dimension. (In less homogeneous countries than Sweden, of course, other kinds of local loyalty might be involved.)

More specifically, Swedish centralism raises financial questions about local administration that the Swedes themselves are seeking to answer. The particular method by which the central government pays its 60 per cent share of education costs is under criticism. Being closely tied to the cost of teachers' salaries, it may distort consideration of new teaching methods which might, for example, require fewer teachers and more equipment.

Also, the teachers must tend to look to Stockholm rather than to the locality as their real employer and source of promotion. And not only the teachers: the method by which senior local administrators are appointed is open to the same questioning. For example, the Malmö director of education is, technically, appointed by the King in Council. All this may follow from the slow process of reorganising local government and reducing the total number of local education authorities. But the Swedish experience may not be without its value elsewhere.

Another aspect of centralisation now under discussion in Sweden concerns the method by which the Government should ensure the production and distribution of educational materials. The official policy is to make public funds available for investment in publishing (using the word in its widest sense) and the Government has bought a share in a publishing house together with the local authorities.

The importance of ensuring production, given a strong belief in the Methods-Materials-Systems approach, is obvious enough. How to do this is a question which has exercised curriculum reformers in many countries. Various forms of sponsored publication are possible, of which state publishing is only one. There can clearly be ideological considerations, which may lead some to favour public enterprise in this field as strongly as others will oppose it. The Swedes make it clear that they assume that, for a while at any rate, the State publishing house will only have a small share of the total turnover of educational publishing. But whichever ideological view is taken, the link between a State publishing house and a highly centralised system would become an obstacle to fruitful innovation if it literally gave an imprimatur to new orthodoxies, and restricted the choice of materials available to the schools.

Research and Development

The third aspect of Swedish innovatory technique in education which stands out is the importance given to Research and Development. To some extent it is inevitable that this should tend to be somewhat exaggerated in any description of "rolling reform" as an administrative concept. But any conclusions about Swedish practice would have to stress Research and Development and the faith which is being placed in the social scientists. In this context, this amounts not only to faith in what the social scientists can do now, but also in what they will develop the tools to do in the future.

Here, of course, is an area in which opinion will vary from the more sceptical forms of agnosticism to the more sublime expressions of faith. But this reliance on the social scientists to produce quasi-scientific prescriptions for the curriculum, like the centralised administration, must have an important bearing on the role and function

of the practising teacher. It could be argued, in fact, that the more completely the faith which is being placed in the social scientists is vindicated, the more the present role of the practising teacher is being undermined.

Certainly one of the outstanding tasks is to find ways of contributing to the professional development of teachers while at the same time drawing on the full range of skills which the social scientists have to offer. The involvement of the teacher lies at the centre of the process of curriculum renewal - because what is being aimed at is a change in the whole complex set of relationships which go to make a school, and these depend largely on people, not materials. The materials go a long way to induce and to monitor the changes in social relationships, including the change away from authoritarian attitudes on the part of the teachers. But just as there is more to education than instruction, so there is more to a school than a set of learning systems.

APPENDIX

National Board of Education
Research Planning Bureau (L4)
Stockholm, Sweden.

School Research Projects

1968-69

	Start year	Continues according to present plan until	Estimated costs 1968-69	News letter No.
Instructional Conditions				
Job analyses: teacher training, concerns lecturers in methodology, tutors (and heads), for drawing up educational programme	1967	1971	225	1968:13
Social upbringing: ages 7-16, mapping intended to construct teaching spec. devised to train ability to co-operate, resistance to propaganda, etc.	1967	1971	195	1967:9
Adult education: mapping of adults' study requirements and conditions, intended to draw up effective instructional methods (2 projects covering different fields under way)	1967	1973	150	1967:11
Goals and methods for 6-year olds: analysis of goals, mapping of present nursery school programme in relation to goal analysis, testing of new elements and methods (2 projects covering different fields under way)	1968	1977	100	1969:3
Children with defective sight: registering of problems, attempts to draw up integrated course material	1968			

	Start year	Continues according to present plan until	Estimated costs 1968-69	Newsletter No.
Instructional Processes				
Systematic instructional analysis of teacher and pupil behaviour, intended to bring about more efficient training programme for teacher candidates	1964	1972	170	1969:2
ITV: construction of models for teacher training using TV as an educational technological component system (2 projects covering various fields under way)	1963	1971	290	1967:8 1968:18
ADL: concerns construction of systematic training programme for the severely mentally handicapped	1968	1970	65	1968:8
Gymnastics: mapping of organisation of instruction in order to define improvements	1968	1970	70	
KUMPAN: development of method to register the forms and effects with which various courses planning phases are treated	1968	1971	140	
SIFON: development of methods for guiding and measuring the instructional processes in the lower forms of the comprehensive school	1968	1971	50	1968:20
VGL: development of methods for guiding and measuring of effects in schools with groups of varying sizes and team teaching	1968	1973	20	

	Start year	Continues according to present plan until	Estimated costs 1968-69	Newsletter No.
SESAM: independent work operated by pupils with multi-component materials: testing of study materials and an organisation with individual curricula	1968	1973		
Literature reading in the Higher Secondary School: experiments with new forms of literary instruction	1968	1972		
Effects of Instruction				
GPU: construction of better methods for marking and admission to Higher Secondary Schools	1964	1970	95	1968:5
Youth in Gothenburg: comparing the effects of the senior forms of the Comprehensive School with earlier types of schooling for corresponding age groups	1963	1971	45	1968:14
Adjustment, behaviour, achievement: a study of pupils ill-adjusted to school life in an attempt to define improvements	1964	1976	200	1968:17
Maturing process: describing variations in the maturing process in children aged 9-16	1964	1970	25	1967:12
Study techniques: construction of group tests for measuring independent judgement and productive originality	1968	1971	55	

	Start year	Continues according to present plan until	Estimated costs 1968-69	Newsletter No.
Discernment in studying: the construction of tests as a basis for discernment in studying at county colleges (folkhögskolor)	1967	1970	45	
Individual statistics: analysing links between home background, school structure, choice of studies, school results, etc.	1967	cont'd	45	1968:16
KUL: the development of methods for the qualitative evaluation of teacher training	1968	1974	100	
The effects of marks and methods of work: the importance of various rewards for the pupils' choice of goals, wish to achieve, satisfaction with results, etc.	1968		45	
Development of Systems				
IMU, Mathematics, ages 14-16	1963	1972	670	1968:12
IMT, German, ages 14-16	1965	1973	440	1967:3
IME, English, ages 14-16 (2 projects covering different fields under way)	1965	1970	470	1966:27 1969:4
Civics, ages 14-16	1967	1970	160	1968:19
Religious knowledge, ages 11-13	1967	1971	170	1968:2
SAG, History, ages 17-19	1965	1973	220	1968:11
Education, Teacher training	1968	1972	140	1968:15

	Start year	Continues according to present plan until	Estimated costs 1968-69	Newsletter No.
SMID, Swedish, ages 7-8 for the deaf and those with defective hearing	1964	1972	240	1968:3
School for the handicapped, Swedish, Learning to Read, ages 7-9	1965	1971	125	1968:4
Teach yourself material for pupils with difficulties in learning, Swedish, Mathematics, ages 7-16	1967	1971	185	1969:1
Other Projects				
School in the 1980's: an attempt to determine trends of development with regard to the renewal of educational material and forms of work	1968	1970		
The study packet in educational technology: presenting a concentrated course in educational production to relieve the acute shortage of educational technologists	1968			
Career teaching problems: developing an overlapping theoretical model for research and development work in career education	1968			
Training research and development personnel: training in educational construction technique for subject experts and training in school research		cont'd	250	
Planning, information: coordination and guidance of the continuing expansion of research and development		cont'd	251	
			5,451	

initial development - and other agencies have not emerged to provide this support. Secondly, perhaps the most precious resource for the support of innovation is time. In particular at the school level teachers often require time free from teaching duties to acquire new knowledge and skills and, importantly, to collaborate with other teachers. Thirdly, to innovate "on the cheap" can often be frustrating for teachers. Head-teachers and Local Education Authorities may be reluctant to invest in expensive materials or equipment, and rationalise this by claiming that it is appropriate that teachers should produce their own. It is true that teachers can often produce innovations which are suited to their special problems, but innovation "on a shoestring" can often lead to strain. The importance of the investment factor should not be underestimated, but it is not the central concern of this paper.

14. Finally, we can touch briefly upon the role of non-teaching personnel in supporting innovation. The actual and potential roles cannot be given in detail here, but perhaps two functions can be identified. One is the release of teaching personnel from non-professional or semi-professional activities in order to allow them the time which is so essential to the planning and implementation of innovation. The other function is much more directly related to innovation and involves a professional service to teachers. An example would be the Inner London Education Authority's introduction of the Media Resources Officer, a well-trained and professional person skilled in providing teachers with learning resources in non-print media. Yet although it would appear that non-teaching personnel of various kinds could make a valuable contribution to the school's capacity to innovate, the extension of this practice is dependent upon its acceptance by the teachers' associations. Hitherto, these associations have expressed reservations about the employment of non-professional or para-professional people in schools, fearing that they might eventually take on some of the fully professional tasks of the teacher. There are also reservations about changing the balance between teaching and non-teaching personnel in schools. The teachers' associations would want to be assured that any developments of this kind would not be at the cost of expanding the teaching force.

15. "Tissue rejection" occurs where there is a discrepancy between an innovation and the "pedagogical code" of the school. Many current innovations are underpinned by a "code" which is quite radically new as far as the adopting school is concerned. This "code" may perhaps place an emphasis on openness and flexibility in matters of curriculum, methods and the organisation of learning. There are problems of institutionalisation at two levels. At the more superficial level there is the problem of institutionalising the "medium", e.g. materials, hardware, pupil-grouping. At a more fundamental level there is the problem of institutionalising, not only the medium, but also the "message" it carries, which is derived from the new pedagogical code. The media can often be readily adopted by one part of the school; the "message" requires a switch in code on the part of the school as a whole.

16. The problem of institutionalisation at these different levels has been illustrated in some of the studies which have been carried out on the process of innovation. Shipman studied the Integrated Studies Project financed by the Schools Council and based upon the University of Keele. Thirty-eight schools were involved and the strategy was of the "network" or "systematic social interaction" pattern referred to in the previous section. The direction of change was towards the integration of subjects, learning by enquiry and team-teaching. Shipman found that the innovating teachers experienced anxieties arising from those elements of the innovation which were characterised by what has been termed "openness" e.g. loss of the security formerly to be derived from subject teaching, classroom teaching and established modes of evaluation. The teachers experienced a variety

of pressures, some of which arose from the fact that their schools continued to function in traditional ways. The key issues determining the success of the innovation were: the degree of initial investment made by the teachers and their schools, the degree of support from outside agencies, and the degree of support from the Head and other teachers in the school.

17. Although not the only factor determining the success of this particular innovation, the support given by the school as a whole and its adaptive, creative capacity appears to have been most important. One might surmise that the support of the school for an innovation carrying a radical "message" is likely to be forthcoming where the underlying pedagogical "code" of the school is shifting. Where this is occurring, the institutionalisation of any innovation underpinned by the openness/flexibility code will be relatively easier to accomplish. But does the "code" change as the result of the adoption of a number of "message-carrying" innovations, in spite of the apparent difficulties of institutionalisation? Or does the prior innovation of a switch in the pedagogical code from within result in the successful institutionalisation of innovations already available?

18. Present evidence suggests that the major impetus for change comes from outside the school. At the same time there are indications that some schools are seeking to establish a positive attitude to innovation from within the school which is congruent with its pedagogical code. Such schools have been compared with the "learning systems" described by Schon. They utilize the strategy which Havelock has termed "problem-solving". This approach identifies a need, translates this into a problem, conducts a diagnosis, and institutes a search and retrieval process for information which can be used in formulating or selecting an innovation. Set out thus, the procedure is perhaps described in terms which are too tidy. Problem-solving is rarely as neat as that. But it does at least indicate the approach some schools are seeking to adopt where innovation is self-initiated on the basis of felt needs. But again, this approach is in itself quite a major innovation in the social system of the school.

III. INNOVATION AND THE SOCIAL SYSTEM OF THE SCHOOL

19. It is a major assumption of this paper that the school as a social system can be creative. This is not to deny the significance of the creative individual. Creative teachers and Head-teachers have been very important in the development of educational innovation in Britain. They have been the prophets and pathfinders - and often the rebels who have caused educational institutions to take a look at themselves. But education is a shared enterprise and even the rebels have had to persuade colleagues to adopt their proposals (and there have been some notable cases where rebels have been unable to gain this co-operation and their innovative efforts have not succeeded - at least in that place at that time). But in the ordinary run of educational life it is the quality of the school as an institution which is the important factor since perhaps the majority of educational innovations involve groups of teachers, if not entire schools. It is also an assumption of this paper that creativity requires the various components of the social system of the school to be, as it were, in phase, and that there is no great discrepancy between values, internal organisation, authority patterns, curriculum and modes of teaching. One of the problems leading to the tissue rejection of innovations is that there has been a lag between the new materials or methods and the organisational changes, finance, equipment, and training facilities required to support them. In this section we can consider in turn several components of the social system of the school. In each case we can look at the traditional schools, identify the changes required to sustain a creative approach, examine

some of the barriers encountered and suggest necessary changes. Although these dimensions are considered separately, it is important to appreciate that they are closely interrelated.

Authority

20. Any discussion of authority within the school must inevitably begin with a consideration of the role of the Head-teacher. It is frequently affirmed that the British Head-teacher has a greater degree of authority than his counterpart in other systems. This can be seen as a corollary of the relative freedom of the school from external control by outside bodies which gives the Head-teacher a high degree of responsibility for the internal affairs of the school. The Head-teacher combines in the one role both policy-making and administration functions. He heads the two hierarchies of the school: the academic hierarchy based upon subject departments in which the Heads of Department play a key role, and the pastoral/administrative hierarchy based on the administrative sub-divisions of the school (e.g. houses) in which the Head of Division plays a key role.

21. Although the Head-teacher enjoys a considerable degree of authority, it should also be noted that the assistant teacher enjoys a considerable degree of autonomy. This is especially true where the unit of instruction is one teacher per class. Behind the closed door of his classroom the teacher functions in a relatively private setting, observed by his pupils but not by other teachers. This isolation is supported by a strong professional norm which affirms the teacher's freedom from the interference by other adults. His major constraint is the syllabus for his subject which he may or may not have been involved in devising. But he enjoys considerable autonomy in matters of teaching style, method and relationships with pupils. We thus have the situation where the Head has a high degree of authority over matters of policy but little control over the teacher's classroom work. On the other hand, the teacher has his classroom freedom but may be little involved in the policy decisions of the school.

22. The relative classroom autonomy of the teacher puts a premium on the Head-teacher's leadership skills. School policies have ultimately to be operationalised by teachers and this requires the Head to perform his role in a manner which is sufficiently motivating. This is particularly relevant to innovation since leadership is essentially concerned with changing the school's goals or the procedures for attaining existing goals. The key role of the Head-teacher in the school is central to innovation. He has the necessary authority to introduce innovations into the school, he has the opportunity to view the school as a whole and hence to see the need for innovation, he has contact with the "messengers" of innovation (e.g. inspectors), and he controls the resources which innovation usually requires. Thus not only does the Head have the opportunity to initiate innovation himself but, where an individual or group of teachers wishes to introduce an innovation into school, the support of the Head is essential, for he must make the necessary resources available and arrange for any reorganisation in the school which may be involved. Thus, the innovativeness of schools has been very much a function of the leadership style of the Head and his capacity both to initiate innovation and secure its implementation and also to encourage innovative activities on the part of teachers.

23. Given the key role of the Head in the school, it would be easy to see the answer to the problems of innovation in terms of the leadership training of the Head. This is undoubtedly important but is perhaps not sufficient. It is currently argued that a change in the authority structure of the school is necessary. This is based on the view that the present authority structure inhibits the innovativeness of teachers. There is thus pressure for a move towards a collegial pattern of authority whereby professional equals govern

their affairs by internal democratic procedures. This move has two major sources. It is partly the outcome of changes in the social and political climate with its growing emphasis on the participation in the decision-making process by those whom the decisions will affect. It is also partly suggested by changes in the nature of teaching which are bringing teachers into closer collaboration and hence involving more lateral decision-making in the school.

24. Many Heads, especially in large schools, have created decision-making structures that involve teachers in policy making, and the very size of the new secondary schools has necessitated more delegation than in the past to subject departments and school divisions. In some large schools most of the responsibility for the day to day running of the lower, middle or upper levels (also called "schools") has been delegated to their respective Heads. But it is argued that authority is still hierarchical and teachers are involved in decisions about the educational policy of the school to a lesser degree than they are involved in administrative matters.

25. The greater involvement of teachers in decision-making may enhance the creativity of the school. On the other hand there are some unanswered questions concerning the viability of collegial authority. One major question concerns the role of the Head. At the present time he is responsible to his governors and to the LEA for the internal affairs of the school and must retain ultimate authority unless his responsibility is to pass formally to the staff as a collective to be exercised through an elected chairman. There are few signs of this possibility at the moment, although some schools have established "academic boards" which debate school policy but do not unsurp the final authority of the Head-teacher. The other question concerns the leadership role of the Head with regard to innovation. There is little doubt that innovation owes much to the most progressive of the British Head-teachers. The question must now be asked whether the same initiative can be given by the collective leadership of teachers of whether self-cancelling "veto groups" might not inhibit innovation. A further question concerns the willingness of teachers to participate in the exercise of collegial authority, since this would be an additional burden and perhaps detract from their work satisfaction which is mainly derived from the activity of teaching.

26. These must remain open questions. What is required at the moment are experiments in different forms of decision-making patterns in schools. One notable experiment is being carried out at Countesthorpe College in Leicestershire. The school was established with a specific mandate to incorporate many of the current innovations in education within a single project. Its first Warden, Tim McMullen (now with CERI), was appointed from the Nuffield Resources for Learning Project and two of his colleagues on the Project became members of the Countestnorpe staff. The curriculum innovations introduced included some interdisciplinary studies and the widespread use of self-instructional materials. Close relationships with the community were established and teacher-pupil relationships were liberalised. However, we are concerned here only with authority patterns. McMullen yielded his Head's authority to the staff meeting (or "Moot") which met weekly to discuss the overall policy of the school. Although still formally responsible for the internal affairs of the school, the Warden (Headmaster) regarded himself as the chief executive of the policy board of the school which elected an executive committee of senior staff to be responsible for decisions that had to be taken between its meetings.

Professional Relationships

27. The traditional structure of the British school involves the isolation of the teacher from his colleagues at the level of the day to day work. The emphasis has been on specialised subject teaching with one teacher to one class as the basic form of organisation for

instruction. Collaboration between teachers has been confined to deciding the concent of the subject syllabus by members of an academic department - although this has been on a limited scale in some cases with the syllabus simply being handed down. The trend is now towards a greater degree of interdependence amongst teachers. This is occurring at a number of levels. The breaking down of subject barriers and the increase in interdisciplinary enquiry has led to increased collaboration across subject departments. This has often been accompanied by team teaching. This term has, of course, many connotations, but it is used here in a broad sense to include those forms of teaching which involve collaboration between teachers involving either the simultaneous teaching of a single group of pupils or the joint responsibility for a large number of pupils who may be learning in groups of different size. Another trend in the case of interdisciplinary teaching, and also in the case of discipline-based work, is for teachers to collaborate in the formulation of educational objectives. Finally, as noted previously, as the pattern of authority in schools moves towards collegiality, teachers become increasingly involved with each other in formulating school policy.

28. The greater interdependence of teachers is in many ways conducive to the creativity of the school. Under the system of independent class teaching the innovativeness of the individual teacher could go unnoticed. In a collaborative enterprise this would be observed by colleagues leading to the possibility of building up a body of good practice. Teachers bring to the joint enterprise different forms of knowledge and skill and different perspectives which are advantageous in two ways. The interplay of these individual differences is in itself creative in that it is mutually broadening for the teachers. And in a team situation it is possible to capitalise upon the particular strengths of individuals who can thus make different sorts of contribution to the enterprise as a whole.

29. The major problem that arises from interdependent professional relationships - as many reports have indicated - is that it is likely to generate anxieties in the teacher. He loses the anonymity of the classroom and must demonstrate his professionality to an audience of peers. It is necessary for him to acquire new knowledge and skills in a public setting. He loses the freedom to follow his mood and the opportunity to "rest on his oars" from time to time which he has to some degree in a system of class teaching. And, since the main source of the secondary school teacher's professional identity is his subject, this is threatened as subject boundaries are broken down. The teacher may also view this loss of identity as a threat to his career prospects.

30. We thus see again the dilemma which is the central concern of this paper. Innovation requires a collaborative professional relationship, but a collaborative relationship is itself an innovation. It can only be slowly established over time if anxiety is to be reduced and it is related to changes in the professionality of teachers - to which we can now turn.

Professionality

31. Since professionality is an attribute of the individual, its inclusion in this section on the social system of the school might be queried. But professionality is not simply an input of the school. The school itself is a crucial agency of professional improvement - a point which will be stressed in Part IV. It is for this reason that teacher professionality is here conceptualised as an aspect of the school.

Although a considerable oversimplification is involved, only two forms of professionality are hypothesised here.

The restricted professional can be hypothesised as having these characteristics amongst others:

a high level of classroom competence;
child-centredness (or sometimes subject-centredness);
a high degree of skill in understanding and handling children;
derives high satisfaction from personal relationships with pupils;
evaluates performance in terms of his own perceptions of changes in pupil behaviour and achievement;
attends short courses of a practical nature.

The extended professional has the qualities attributed to the restricted professional as certain skills, perspectives and involvements in addition. His characteristics include the following:

views work in the wider context of school, community and society;
participates in a wide range of professional activities e.g. subject panels, teachers' centres, conferences;
has a concern to link theory and practice;
has a commitment to some form of curriculum theory and mode of evaluation.

32. The movement from restricted to extended professionality would be considerable in the case of many teachers. There is evidence that many teachers who have an intuitive approach to teaching would find the requirements of extended professionality too rationalistic for their taste. Similarly, many teachers derive predominantly intrinsic interests from the activity of teaching and would not in the short term find satisfaction in the non-teaching activities which extended professionality involved.

33. We are thus, yet again, faced with our fundamental dilemma: innovation begets the need for innovation. It is tempting to see the answer to the problem of professionality in terms of the initial training of teachers where new patterns can be induced. There is much in this and the institutions of initial training moving somewhat in that direction. But the inculcation of extended professionality is perhaps the concern of the institutions of in-service training, since it must arise out of experience. It will, therefore, be suggested in the final section of this paper that new modes of in-service training may be required to induce extended professionality.

34. Although this paper is concerned with secondary schools, it is instructive to look briefly at recent developments in the British primary school which caters for pupils up to the age of eleven years. The creativity of these schools has drawn very favourable comments from educationists from many countries. The basic approach is developmental in that the stress is upon nurturing the growth of individual children through shifting the balance from formal class teaching to the creation of informal learning situations with an emphasis on exploration. The curriculum trend has been towards the integration of subjects, with the pupil's own environment taken as the starting point for much of this work. This shift in curriculum and method in the schools has been accompanied by a number of curriculum projects such as the Nuffield schemes for Mathematics and for Science.

35. In spite of the existence of national curriculum projects for primary schools, the transformation has been an informal, relatively unplanned, and more or less spontaneous movement. In order to understand how creativity in the primary school has perhaps been less problematic than in the secondary school, it is necessary to look at their different structures. Firstly, primary education is founded upon class teaching and very limited specialisation. Then, the target of change is the individual teacher rather than the subject department or interdisciplinary team, and the fact that the class teacher is

responsible for most aspects of children's learning means that changes in curriculum and method are likely to proceed as a piece and in phase. A second point to note is that the Head-teacher in the primary school, because of its relatively small size, and the greater opportunity for face-to-face contact, is perhaps in a stronger position than the Head of a large secondary school to induce a more creative school environment. And there is little doubt from the available evidence that primary school Head-teachers, supported by LEA advisers, have played a key role in the recent transition. Thirdly, the relatively greater ease of pupil control in the primary school than in the secondary school is likely to be more conducive to the creativity - although one would not want to press this difference too far. Finally, as the primary schools in Britain have gradually shed their selective functions, they have come to enjoy a degree of freedom from external pressure which the secondary school still experiences in the form of the examination system and other forms of external expectation.

36. The secondary school can certainly take lessons from the primary school in terms of its general educational approach, but it is unlikely that the process of change in the primary school has a great deal of applicability to the secondary school - at least, given its present structure. Its problems are so different that it must work out its own solutions.

IV. SUPPORT FOR THE SCHOOL

37. The argument of this paper so far has been that, although there has been considerable innovation in British schools in recent years, institutionalisation has been a problem since there has been a lag between innovations in curriculum, method and the organisation of teaching/learning and necessary changes in what might be termed the "deep structure" of the school. This is inevitable, since such radical change must be a slow process. Changes in this "deep structure" are being stimulated by the curriculum innovations themselves, but it is suggested that attention should be given to the supports which the school may need to effect this more fundamental shift without undue strain and anxiety for the staff. In this final Part we can consider some aspects of the support which can be given and which, in some cases, is beginning to emerge. The focus will be upon the school itself and the immediate support which it might receive. The assumption is made that the target of this support should be, to a greater degree than in the past, the school itself. The professional development of the individual is, of course, also vital, but it is part of the argument of this section that professional development of the individual and the improvement of the creativity of the school proceed simultaneously.

38. There has been a considerable expansion of in-service training in Britian in recent years This is likely to be furtner increased if the report on the James Committee on the training of teachers is implemented. This report recommended a further increase in provision with a proposal that every teacher should be entitled to one term's sabbatical leave for every seven (and, in time, every five) years served. In-service training at the present time takes many forms, varying from one-day courses on purely practical aspects of teaching to courses of one or more year's duration leading to academic qualifications. For the most part, this in-service training involves teachers attending courses away from their schools as individuals. The argument advanced in the earlier sections of this paper might be seen as indicating the need for modifications in this pattern. Four propositions can be advanced:

i) In-service training should, to a greater extent than in the past, be linked with specific innovatory activities undertaken by the school. This happens to some degree at the present time where teachers attend courses to acquire knowledge and skills relevant to a particular innovation. But this can be extended and linked with the proposals below.

ii) The focus of in-service training should be to some degree a functioning group, e.g. a school staff, a subject department, interdisciplinary teams. The training would thus concern itself not only with the content of change but with procedures for implementing it.

iii) In-service training should ideally begin in the school. The school should establish its own staff development programme. This should be a necessary preliminary to staff becoming involved in in-service training in outside institutions, since this outside support should build upon the requirements of the school which the in-school training will have generated. Ron Pepper, Headmaster of the Thomas Calton Comprehensive School in London, has given an account of the in-school programme developed at this school which, amongst other activities, was concerned with preparing to participate in a new team-based integrated studies scheme. At Cousall Comprehensive School, Staffordshire, the Resource Centre is also an agency for curriculum innovation and in-service training on the shop floor. Although time is inevitably a problem, staff are released from normal duties for periods of one week in order to think, talk and begin to prepare their own materials. Staff programmes should also take account of the career development of individual teachers, since this can be a source of anxiety. Hartcliffe School in Bristol has recently appointed to its staff a person with special responsibility for this task.

iv) The in-school training schemes should have access to the facilities and resources of a professional centre, e.g. libraries, resource centre, residential accomodation.

39. One of the most interesting developments in the British educational system in recent years has been the Teachers' Centre. The majority of LEAs have established at least one of these in their areas. These centres function in very different ways but they generally act as a resource centre, a base for in-service courses and a place where teachers can hold meetings, conferences, etc. There is, perhaps, a case for considerably extending the functions of some of these centres to give a greater degree of support to innovating schools. The following can be suggested as possible functions:

a) Linkage

This term is used to cover those functions which involve linking various institutions by acting as a resource centre (for project materials, research findings, etc.), an information centre, and a liaison between colleges, schools, etc. where a connection would be mutually advantageous.

b) Project support

One of the difficulties of the R, D & D approach to innovation is to ensure continuing support for a school project after the withdrawal of the development team, or where a school has not been involved in the development stage. The professional centre might provide support for these projects and also for projects initiated in a single school and in the process of local diffusion.

c) Consultancy

The professional centre might be a base for permanent consultants or act as an agency

putting schools in touch with consultants. It can be argued that, in order to innovate successfully, a school may need the support of an external consultant who might work with the school in a non-directive manner. The consultant might assist changes in the curriculum, the attitudes, skills and knowledge of staff members, relationships within the school, and school organisation.

a) In-service training

The professional centre could be to provide in-service training. (It should be noted that the James Report recommends the establishment of professional centres based on universities, colleges or teachers' centres for the purpose of providing in-service training. The report does not, however, go into details as to what other functions such a centre would provide).

40. Finally, we can consider the roles of the H.M.I. and the local inspectorate. Inspectors of both kinds have played a most important role in curriculum innovation in this country in recent years by advising schools on specific innovations, arranging courses and conferences, and generally acting as resource persons. They have not, however, usually performed the consultancy role as described above - although there has been a move in this direction. We do not, at the moment, have a great deal of information on the functions performed by inspectors, but the indications are that they are too involved in other duties - particularly administration - to give the sort of help which many of them feel that they have to offer. There might be a case for developing this into a distinctive consultancy role based upon a professional centre.

CONCLUSION

41. The main argument of the paper has been that, although British schools have been willing to introduce innovations, there have been problems in the institutionalisation of these. This is, perhaps, due to a discrepancy between the requirements of the innovation and the quality of the social system of the school. A school which is free to establish its own staff-staff relations, forms of pupil grouping, arrangements for teaching and curriculum, its own form of staff-pupil relations, of school-social environment co-operation and so on (including influence over the promotion of its own educational ideology and a measure of involvement in the in-service education of its staff) is more likely to innovate than a school which does not have this autonomy. At the same time it is suggested that, in order to effect internal changes, a school should have access to a variety of supporting agencies.

APPENDIX CONCERNING SPECIFIC SCOTTISH ASPECTS

The Examination System

1. In Scotland, there is only one examining board. Until 1965 "O" and "H" grade syllabuses and examinations were administered by the Scottish Education Department working in consultation with teachers, professional associations and other interested bodies. Since that date an independent Scottish Certificate of Education Examination Board has assumed these responsibilities. The Board, which is representative of the Scottish teaching profession, universities, colleges of education, industry and the Scottish

Education Department, controls examination procedures while maintaining liaison with the Consultative Committee on the Curriculum (see paragraph 2 below). Through their work as examiners, and through their membership of subject panels of the Scottish Certificate of Education Examination Board, teachers have assumed a predominant role in the conduct of the examination system. While examination systems of any nature appear to have inhibiting factors ascribed to them, they have effected through changes in syllabuses a number of developments, notably in the sciences and in English language and literature. The Certificate of Sixth Year Studies introduced in 1968 has, through the emphasis it places on independent work on the part of the candidates, had considerable impact on approach and methods at this stage.

Agencies Contributing to Curricular Innovation

2. H.M. Inspectors have been actively involved in the machinery of curricular innovation for many years, in the first instance because of the fact that until 1965 examinations were controlled by the Scottish Education Department and because curricular guidance at national level was usually provided by the Department. More recently the Inspectorate has continued to be closely involved in curricular development by association with other agencies. Through these agencies and by the establishment of close working relationships with local authority advisory staffs a consultancy role already exists. The Schools Council's sphere of influence does not extend to Scotland. The Secretary of State for Scotland's main advisory body on education is the Consultative Committee on the Curriculum, which is representative of universities, local education authority administrators, colleges of education, further education, primary and secondary schools. The Secretary of the Scottish Education Department is Chairman of the Committee, which also includes in its membership the Senior Chief Inspector of Schools and two Chief Inspectors. The Inspectorate are also represented on all Working Parties and Central Committees which have been set up by the Consultative Committee.

In the early years of its existence the Consultative Committee investigated curricular areas through a series of ad hoc working parties which were disbanded on completion of their remit. More recently it has been accepted increasingly that curricular development is a continuous process which requires standing bodies to implement it. In consequence central committees have been established in a number of fields (English, modern languages, science, social subjects) and it is the intention to set up others, for example in technical education. In association with these central committees and under their general direction a number of national curricular development centres have been set up. Those existing at present are for science and mathematics, English, modern languages and social subjects. These new centres will be dependent upon a two-way relationship with local groups of teachers, whose number is rapidly increasing.

While much of the activity of these local groups has been concerned with individual subject elements of the curriculum, there is a growing tendency for them to consider aspects of a wider interdisciplinary nature or to go beyond curricular interests, for example conservation of the environment. A further stimulus to local innovation has been given by the appointment in some areas of additional advisory staff, many of whom have been active in stimulating and guiding reappraisal and experiment.

Social Organisation of the School

3. The traditional academic hierarchical structure of Scottish schools is being modified as a result of proposals for a new structure of promoted posts which, after consultation with appropriate bodies, has been promulgated by the Secretary of State for

Scotland. The main function of the new structure is to provide for a more up-to-date and effective management of the educational and social functions of the school of Circular No. 826 "The Structure of Promoted Posts in Secondary Schools in Scotland", HMSO, 1971.

In-Service Training

4. While the recommendations of the James Committee Report do not apply to Scotland, there is general agreement with the concern and views expressed upon in-service training. The swift growth of in-service training in Scotland provided by colleges of education, local authorities and teachers' associations led to the forming in 1967 of a National Committee for the In-Service Training of Teachers in order to co-ordinate courses on a national basis. Plans are well advanced for a series of national in-service courses to be held over the next three years. In addition, a working party set up by the General Teaching Council to consider the training of graduates has produced a first draft of its Report.

VII. THE STRUCTURE OF PROFESSIONAL SUPPORT AND ITS IMPACT ON THE CREATIVITY OF THE SCHOOL

by

Klaas Doornbos
School Advisory Centre, Arnhem, the Netherlands

and

C.M. Geerars
Ministry of Education and Sciences
The Hague, the Netherlands

1. The potential capacity of the school to deal with innovation (especially in a country where schools are equally subsidised by the government) is to a large extent dependent upon:

a) the quality of the teaching staff;
b) the capacity for decision-making in setting up a curriculum and the choice of teaching methods;
c) the stringency of legislation and administrative regulations concerning the internal organisation of schools, working hours and expenditure;
d) the size of the schools (number of teachers) and their distribution over the country;
e) the structure of external professional support to the schools and the educational system as a whole.

This paper focuses on the organisational structure of professional support to the schools and some specific aspects of the impact of institutionalised assistance by experts. (See paragraph 17).

2. In the following sketch of the organisational structure of institutions for educational innovation and the guidance of pupils, we are chiefly concerned with those institutions and provisions which are regarded as forming an essential part of the total educational system of our country: the 3 national pedagogical centres(1) and nearly 30 regional centres for educational innovation and guidance.(2)

The work of the regional centres lays particular emphasis on a direct working relationship with the schools in a region. The activities of the three national centres are often carried out with a more distantial relationship (although this varies with the type of school).

In contrast to the regional centres, the national centres are subdivided according to denomination. Their activities embrace all branches of education with the exception

1) These are the Algemeen Pedagogisch Studiecentrum, Amsterdam, the Christelijk Pedagogisch Studiecentrum, Hoevelaken and the Katholiek Pedagogisch Studiecentrum, 's-Hertogenbosch.

2) These regional centres have such names as: onderwijsadviescentrum, onderwijsadviesdienst, schooladviesdienst, schoolpedagogische dienst, etc. A list of them can be obtained from the Secretariat of the W.P.R.O., c/o Rotterdam, Schooladviesdienst, Rotterdam.

of the universities and some branches of non-university higher education. The work of the regional centres is for the moment primarily directed towards nursery schools, primary schools and the schools for special education, although their services are being increasingly extended to various types of secondary education.

Further, there are various institutions engaged in promoting and stimulating educational development without entering into a direct working relationship with individual schools or groups of schools: the Foundation for Educational Research (Stichting voor Onderzoek van het Onderwijs, 's-Gravenhage), the National Institute for Test Development (Centraal Instituut voor Toets-Ontwikkeling, Arnhem), several subject Committees for Curriculum Improvement (Commissies Modernisering Leerplannen) and various institutions in the field of audio-visual media, such as school television. The increasing influence of university departments and institutions closely connected with universities also deserves mention in this context.

The publishers of educational materials (school books and teacher manuals) have their own production teams (authors) and developmental institutes (with international connections). These commercial establishments fulfil an important function in the process of educational development, but are not counted as belonging to the field of professional support.

3. Professional support for the schools becomes an increasingly important factor in the complicated process of educational change as other circumstances (see above 1 a-d) impede the process of strengthening the creativity of the school. The impact of external support is also sometimes restricted by impediments in the schools themselves.

Two conditions seem to be of crucial significance: flexibility in the employment of working hours and allocation of financial resources to the school itself. It is detrimental both to the problem-solving capacity of the school itself and to the response it can make to professional support from outside if the working hours of the teaching staff are filled with straightforward teaching. This is in part a consequence of legal regulations, but at the same time a question of the teacher's approach to his work. Restrictions of the capacity for decision-making with regard to allocation of financial resources at a local level is also unfavourable to the creativity of the school. Flexibility is a necessity whereby individual schools may themselves (with professional support) achieve a redistribution of the financial resources in accordance with the requirements of a particular innovation policy.

4. It is, of course, important for the planning of professional support to schools to know the extent to which the restrictive conditions are a consequence of legal precepts and administrative formalities, or else in part based upon tradition, nonchalance, lacunae in the professional training of teachers and administrators, or status seeking - for instance in building schools luxuriously. Since existing practice with regard to employment of manpower and allocation of financial resources is of central importance for the planning and management of innovative activity, professional support to the schools must be increasingly extended to the educational and administrative authorities both at a local (or regional) and a national level.

Despite the justifiable fear on the part of several professional advisers (educationalists, curriculum-specialists, psychologists, change-agents, co-workers, etc.) of finding themselves in situations where there is a built-in conflict of duties, development of all-inclusive school advising is increasingly recognised to be inevitable. These advisory functions chiefly involve policy with regard to the selection of teachers and school-heads, basic principles and planning with regard to the regulation of working-hours, financial policy (especially long-term planning), and some decisions concerning school buildings and furnishing.

5. As may be expected at the present stage of development of a comprehensive structure of supporting institutions, questions of some weight and interesting points of discussion arise. There is a variety of views as to the most efficient form of management for the centres and the way in which the participation of the schools, school boards and parents could be organised and canalised. There must be a continuous critical evaluation of the centres' form of management and the work programmes they are trying to effect; the participants in the innovational actions and processes cannot be left out in this. A further point of discussion is the distribution of tasks and responsibilities between the participants within the field of work. The discussions in fact touch upon the very foundations of institutional service and upon the principles and expedience of models and strategies of educational innovation.

In themselves these discussions form a positive element in the process of actualisation of the innovative capacity of both the schools and the supporting centres. The relevant functions of the other supporting agencies at the national level (mentioned in paragraph 2) will, of course, be taken into account in these deliberations. At the same time, however, it is noticeable that in the exchange of ideas at the school level attention is paid only sporadically to links with fundamental research in education and psychology. One may speak of widely separated worlds.

6. In order to achieve a proper idea of the development of institutionalised professional support in the Netherlands, and to attain a realistic frame of reference for an accurate assessment of the rationale behind the present structure, some further information concerning our educational system is necessary.

The Scattered Educational System

7. Holland is a small but very thickly populated country (389 inhabitants per km^2). Yet there are only a few large schools. The great majority of schools, including those at the level of secondary education, is of a limited size, and there is a surprising number of really small ones (particularly nursery and primary schools).

The dispersal of the educational system which has come about historically is a significant factor in the process of construction of an adequate structure of supporting agencies. Consciousness of this has developed especially during the last ten years. This process is characterised by two interacting tendencies: decentralisation and regionalisation.

On account of the great number of schools necessarily involved, there is a tendency at the centre to neglect many concrete innovational tasks and leave them to regional and local institutions (decentralisation). There is no question of delegation in this, since structural relationships between the network of regional centres on the one hand and national centres on the other are absent. As a result there is a great need for co-ordination.

At local and regional levels, on the other hand, autonomous activity is observable as a marshalling of forces unique in the history of Dutch education, leading to co-operation between the Boards of schools of different denominations in the administration of the regional centre. This has formed a basis for numerous working relationships between the schools and the regional centre, and conduces to ever-increasing co-operation between the schools themselves. The people in the schools and the School Boards themselves are clearly starting to think within a widening horizon where the interests of a region as a totality come into view (regionalisation).

8. Approximately half the Dutch population lives in 21 urban agglomerations, each having more than 100,000 inhabitants. The other 6.5 million are scattered over about 700 medium-

sized or small municipalities. Although these local authorities are the smallest administrative units in our country, they are in no sense the smallest living communities. More or less all municipalities are subdivided into "living centres" (districts, villages, hamlets) usually of such a size that one or more schools are established there. Where there are sufficient children, each centre of population may have its own school.

In this way a village may, for instance, have three nursery schools, each with one teacher, and three small primary schools, a Roman-Catholic school, a Protestant school and a non-denominational school (or State school), each with its own Headmaster and, for example, only one other teacher. For the primary schools the situation amounts to this: there are three Headmasters and three teachers, with a total of 130 pupils from 6 to 12 or 13 years of age, spread over three separate school buildings less than a stone's throw from each other. In the medium-sized municipalities large enough to maintain various schools for secondary education, similar situations may occur, although different numbers of teachers and pupils are, of course, involved.

9. Every school owes its existence to a sufficient number of pupils: as soon as this falls below the legally established minimum the government subsidy is withdrawn. Within the secondary schools a relatively small number of pupils sets a serious limitation on the differentiation in courses of study which is now generally considered desirable and made possible in the form of choice between "parcels" of subjects ("optional subjects"). In many cases - certainly at the nursery and primary school level, but also within certain types of secondary education - care for the continued existence of the school as such calls for much attention and inventiveness on the part of those whose employment after all depends on the number of pupils - namely the teachers.

This situation places certain restrictions on the regional centres. Co-operation with the schools and between the schools themselves, in so far as they participate in projects of educational change or other innovation activities, must not be endangered. After all, the continued existence and the activities of the regional centres depend upon such co-operation between "competitors" (i.e. schools competing for a sufficient number of pupils).

The inevitability of decentralisation of professional support is immediately clear from a brief survey of the Dutch school system as such. Attention has already been drawn to the marked scattering of the schools with, in consequence, the relatively limited size of the individual schools. Briefly, the picture is this: in 1970 there were about 6,400 nursery schools with 492,000 children from 4 - 6 years old and 16,000 teachers; about 8,200 primary schools with 1,465,000 pupils from 6 - 12 years old and 48,000 teachers; almost 800 schools for handicapped children with 74,000 pupils and 6,100 teachers; about 4,000 schools for secondary education with 1,073,000 full-time students (pre-university and non-university higher education included, the latter category containing, inter alia, no less than 142 teacher training colleges); and 13 universities with 102,000 students. The facilities for part-time education available for young people at work are not here included.

It is clear that the field of work is immense, even though university education and some branches of non-university higher education are excluded from the forms of professional support discussed in this paper. It should be pointed out too that a start has been made in setting up institutes for professional support in the universities, and as these constitute part of the civitas universitatis it is possible to speak of them as a form of internal professional support.

10. Nevertheless, the recent recognition of the necessity for a decentralised approach is not primarily a consequence of the size and dispersion of the schools as units within

the educational system. Acceptance of a new model for invoking professional support for innovative action and the guidance of pupils has probably been the crucial factor. This new approach is based upon the participation of teachers in concrete projects and activities directed towards educational change. In this the aims and priorities are fixed in mutual discussion and the direct presence of professional advisers in the schools can be depended upon during execution. The continuity of such support is guaranteed by adequate co-operation at the administrative level - that is, between the educational authorities (school boards), the centre's board of management, and the local authorities (town councils).

Towards an Integrated Structure of Professional Support

11. The present situation can be described with some optimism as a transitional stage between a period with an uncoordinated disjointed system of professional support and a new era with an integrated approach towards innovation and guidance. School education has come under the influence of outside powers to an increasing extent, especially during the present century. Among the results of this are the improvement in teacher training colleges, the creation of the school medical service, the improvement in the quality of school books, learning materials and teaching aids, the increased interest of the universities, the extension of the activities of mental health organisations and child guidance clinics, the setting up of pedagogical centres for dissemination of information and new ideas and practices, and of recent date the interest of researchers, economists and activists. The idea of co-ordination and - as far as possible - integration of activities is gradually gaining acceptance. In consequence help for the various separate schools from professional advisers who are also well-informed about the specific problems of each of the schools and have the confidence of the school staff, is quite essential.

12. We have just been speaking about an integrated approach and the need for co-ordination. It is inherent in integrated planning in the field of innovation and individual guidance that the interests of individuals (each of the children and their teachers) and systems (separate schools and local educational systems) should be promoted equally. Professional support to the schools is not one-sidedly directed towards educational change, nor limited to an attempt to adapt individuals to existing systems. It is obvious that the realisation of such a strategy necessitates decentralisation and regionalisation during its implementation.

With the transfer of the essential activities to the basic units of the educational system - i.e. the schools and the regional centres - the problem of their co-ordination and harmonization inevitably arises. Strengthening of the bonds between the schools themselves and extension of the co-operative relationship recently assumed by the existing regional centres are necessary but not sufficient conditions for this. Too much diversity in the development of education should be avoided for reasons of principle as well as on pragmatic grounds.

There is also some disharmony between systems of professional support within the sector concerned with institutionalised innovation in schools. This is due to the absence of structural relationships between the national pedagogical centres and the regional centres. The situation is further complicated by another difference: the national centres are chiefly engaged in supporting projects of educational change, while the regional centres pursue a policy of integrating educational change with individual guidance. They include the traditional mental health dimension in the total strategy of support for the development of education.

13. A basic principle underlying the promotion of creativity of the school should be respect for the teachers and students in their own right. This also applies to the relationship between support centres and the schools, particularly when the chief aim is provision of adequate material for pupils and teachers by means of manuals and syllabuses, or courses and supporting material for schooling or in-service training. Computers must be programmed, but people may not be and, if all is well, educa s cannot be. To leave room for initiative is to create room for reflection, discussion and co-operation.

Another consideration of importance at the start is the involvement of parents, educational authorities, and (in secondary education) the students themselves. Care for the efficient propagation of information is the minimum required of those directly involved in innovative action. The primary responsibility for contact with parents and others involved lies - pragmatically and in principle - with the school itself.

Co-operation between practitioners and professional advisers should start on a voluntary basis. From the moment, however, a project starts and appointments have been made, a definite commitment binds both partners. In the past much energy and goodwill has been lost because the co-operative relations between agencies of professional support and the schools involved in innovative activities were set up too casually. Guarantees for the continuity of support to the schools are of the greatest importance for the growth of mutual confidence between teaching staffs (and others involved, such as parents and inspectorate) on the one hand and the innovation experts and consultants on the other.

The Central Issues: Curriculum, Individual Differences and Democratisation

14. Every process of educational change has its starting point and expression in the school itself. This applies not only to innovative activity arising from co-operation between schools and professional advisers, but also to educational changes brought about by a capacity for self-renewal on the part of the schools themselves. There are three central issues:

i) The curriculum as a blueprint for the functioning of a school, a group of schools or a local school system. The curriculum states the aims and contents of the educational process, it motivates the application of specific teaching methods and aids, it defines the assessment of pupil performance and teacher effectiveness, it contains recommendations for the planning of activities, the internal school organisation, the grouping of pupils and so on.

ii) The individual differences between pupils as a problem for the school as an institution, and a challenge for the teachers and professional advisers working with and for the children.

iii) School life and the tendency towards democratisation of teacher-pupil relationships and of decision-making in the school context, against the background of changes in social life within contemporary western democracies. We shall not go further into this issue, as it has been treated already by H.J. Jacobs in Chapter IV.

15. The need for professional support to the schools, both in the construction and periodic revision of the curriculum and in the individualisation of school education (e.g. non-grading), is becoming increasingly recognised. The extent to which professional advisers are called in, however, varies with the nature of the problems involved.

A large number of problems can be solved satisfactorily by the schools themselves, with just a little assistance from regional or national centres. This presupposes in many cases an improvement in communication between the schools and these agencies. This had been partly a structural problem and partly one of teaching staffs getting used to their

new potentialities (end of isolation, increase of written communication, appreciation that two heads are often better than one, and so on). The primary aim of the contacts and discussions between the practitioners in the schools and the advising educationalists and psychologists amounts in many cases to the restoration of confidence in the problem-solving function of the schools by stimulating awareness of their own capacity for decision-making.

A period of thorough preparation will be necessary before it is possible to come to grips with the really broad issues, such as those concerning the external structure of the school system and developments on a national level. Already, however, at least two prerequisites seem clear. First the necessity for combined planning of national and regional institutes, in close co-operation with specialised national institutions, on the basis of active co-operation and real support from central and local government. Secondly, there will have to be a team of professional advisers which already has the confidence of the schools and will be available for concrete assistance in the classrooms.

Co-operation, Co-ordination and Control

16. We have already alluded to the contemporary dependence of the regional and national centres on the support of specialised national institutes and committees and on the productions of educational publishers. Co-operation between the centres, institutes and committees is to an increasing extent regulated via points of co-ordination in the national and regional centres /see paragraph 17, (a) and (b)7. Preliminary contacts with the same aim in view have also been made with the publishing companies.

More is, however, needed. Co-ordination is desirable to limit diversity in the development of the schools and their programmes. At the same time, supervision is necessary to avoid particular emphasis on any one aspect. There must be a survey of the developments within the schools and the regional centres to enable each of them to compare their own contribution in the process of educational change with developments in the schools and centres in other regions.

17. A few points of contact and structural relationships for co-operation have gradually been developed through the initiative of the centres and other institutes. Such initiative has not yet been taken, however, in the matter of supervision. At a national level, the following summary of cross-relationships may be of interest as a supplement to the more generalised statement with which this paper began.

a) The regional centres for educational innovation and guidance have joined forces, the Association of Local and Regional Educational Advice Centres ("Werkverband van Plaatselijke en Regionale Onderwijsadviescentra - WPRO).

b) The national pedagogical centres collaborate through the Association for National Pedagogical Centres (Vereniging Samenwerkende Landelijke Pedagogische Centra - VSLPC).

c) A great diversity of institutions and associations which are in some way of service to schools and/or school children (primary and secondary education) find an opportunity for guidance and mutual consultation in a national council known as the Landelijke Raad voor Schooladvieswerk - LRS. It caters for institutions such as the school medical service, mental health organisations, pedagogical centres, teachers' unions, bureaux for educational and vocational guidance, and the like.

d) Contacts between the above co-ordinating centres and institutions and the Ministry of Education are usually maintained via the Ministry's department of Research and Planning (Afd. Onderzoek en Planning - OP).

e) A Foundation for Educational Research (Stichting voor Onderzoek van het Onderwijs - SVO) has been set up to stimulate research and development in education and to finance specific projects in this field.

f) The close relationship between the Ministry of Education and the Foundation for Educational Research (which is already financed directly by the Ministry) is illustrated by their joint membership of a co-ordinating committee that subsidises official experimental projects on educational change. This is the Commissie Onderwijskundige Experimenten - COE.

g) The National Institute for Test Development (Centraal Instituut voor Toets-Ontwikkeling - CITO) has already been mentioned (paragraph 2) as one of the specialised national institutions concerned with the promotion and stimulation of educational developments. In the present context of creativity it is relevant to recall its recent interest in the objectives and content of school education. This Institute also co-operates with schools and the national/regional centres.

h) The Ministry of Education has created several committees for curriculum improvement (Commissies Modernisering Leerplannen - CML). These concern themselves with the content of educational innovations, with refresher courses for teachers (mainly secondary education), and with the adjustment of final examinations. Some of them provide a modest professional administrative service; the ldest runs a specialised institute for the development of the teaching of mathematics (Instituut voor de Ontwikkeling van het Wiskunde-Onderwijs - IOWO).

i) The Ministry of Education has also set up an official Committee for the Organisation and Co-ordination of Curriculum Development (Commissie Organisatie Leerplan-Ontwikkeling - COLO). This has recently advised the Minister in the so-called COLO Reports for 1971 and 1972. How far the analysis and recommendations of this committee will be adopted is not yet known; it is certain, however, that the Committee's initiative in this field, particularly when co-ordinated with the policy of the Ministry, will have a great influence on the development of education in the Netherlands.

VIII. SOME FACTORS AFFECTING THE CREATIVITY OF PORTUGUESE SCHOOLS

by

Adelino Amaro d. Costa
Bureau of Educational Research and Planning
Lisbon, Portugal

1. This report on problems affecting creativity of Portuguese schools will not be exhaustive, nor will it consider exclusively pedagogical aspects. Its aim will be to select those relevant factors that seem to prevent the spread of creativity in basic and secondary(1) schools. Problems concerning school buildings, learning materials, allocation of financial resources, management and the internal hierarchy in the schools will be excluded.

No particular emphasis will be given to aspects strictly related to pedagogy because, as far as Portugal is concerned, factors such as the institutional mechanisms for teacher training and utilisation, the development of innovation, the distribution of powers in the administration of education and the functions of counselling and control in the framework of the school inspectorate are just as important in determining the process of creativity.

2. Education, when considered in itself, appears as an objective in a way independent of historical circumstances, acting as an impelling or guiding force for the educational process centred on a person. The national educational system, however, appears as a set of means situated in the history of some country and at the service of that educational process. As long as this process is carried out in school institutions and particularly in those which devote most of their efforts to the education of youth, it is to be expected that the creativity of the school will depend not only on educational objectives, but also on the structure and functioning of the formal system of education and its capability of assimilating the vast experience resulting from the extra-curricular activities of young students.

The Teaching-Learning Process

3. So far as students are concerned the action of educational agents finds immediate expression through the teaching-learning process. The teachers' mission in school or with regard to young people does not of course end there, but the teaching-learning process is certainly one of the most significant indicators of the pedagogical relationship. Brief notes on this process will help to illustrate how the general problem under consideration has been dealt with in Portugal and what the prospects are in the near future. These notes will also throw light upon the inhibiting factors that have the greatest determining influence on the degree of creativity in Portuguese schools.

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1) Terminology used in the present Portuguese educational system.

The Centralised System of Curricula and Syllabuses

4. In Portugal the establishment of curricula and syllabuses for primary (4 years), preparatory (2 years currently) and secondary (5 years currently) levels of education is the responsibility of the central services(1) of the Ministry of National Education.

These departments work out the sets of subjects for each stage and the content of each subject and these are then presented to the Government for approval. In line with the approved syllabuses, different authors submit text-books, manuals and other such school books to the "Junta Nacional da Educacao" (National Board of Education) for appreciation. This is done on a competitive basis and, in most cases, the Board approves only one text-book for a given subject and that book is subsequently used compulsorily in all schools at the relevant educational level. In some cases, however, this selection of a single book is not made and each school is free to choose the one it finds most suitable. An exception - which will probably be the rule in the future - is made with regard to preparatory education. Here there are no single text-books legally defined as such and at present it is the General Directorate for Basic Education that approves the books and, together with the teachers of each educational centre, decides which of them is to be used for each subject.

The curriculum development of each subject as well as the school books - which are one of the most important working tools for the teachers, although they are written for the students - are, therefore, generally established through a vertical, centralised and rigid process. As a result, little freedom is left to the schools to adjust the proposed subjects to the lives and experiences of their students and to local and regional peculiarities, although in the case of some subjects, teachers (and sometimes students) are free to produce their own material. However, this does not dispose of the manuals specially prepared for their guidance nor the rules laid down by the inspectorate for curriculum development.

The Role of Observation and Guidance

5. The activities of observation and educational guidance may be conceived "as a set of compensatory and formative actions, the aim of which is to promote the maximum efficiency of the students and their well-balanced adaptation to life, through the discovery, stimulation, guidance and rational utilisation of their aptitudes and fundamental interests".(2)

Thus observation and educational guidance presuppose a careful examination of every single student and his socio-familial background. In Portugal such activities are systematically undertaken only at the educational level corresponding to the two years following primary education, that is, at the level of the first stage of secondary education. In any case, there is no overall strategy involving a collaborative team of specialists (e.g. educators, psychologists, social workers) in developing patterns of school organisation and teaching method.

The System of Evaluation of Student Achievement

6. Furthermore, the system of evaluation of student achievement in most cases still makes use of the method that gives predominance to the mnemonic capacity of the students. It is

1) "Direccao Geral do Ensino Basico" (General Directorate for Basic Education) for the first two levels and "Direccao Geral do Ensino Secundario" (General Directorate for Secondary Education) for the third.

2) CASTELO BRANCO, Anilcar, Inf. 13/72, (NEE)IE/C. GEPAE, 1972.

therefore difficult to reconcile discipline and objectivity with a pedagogical approach which emphasizes observation, discovery and group-work. Examinations, final or partial, written or oral, continue to be factors which obstruct the creativity process, as are of course the shortcomings in the training of teachers and the nature of school organisation.

FUTURE ARRANGEMENTS

Main Perspectives of the Teaching-Learning Process

7. Any modification which is to be made in the approaches discussed above in order to create favourable conditions for the implementation of creativity demands a prior examination of multiple variables. The approaches described are the result of a complex set of causes that condition the very nature of the present and future teaching-learning process, which cannot be considered in isolation. The desirable lines of evolution of the teaching-learning process which we think feasible, without a sudden break in the traditions of the system, are, the following:

- introduction of a degree of freedom that will allow the school to promote the local adaptation of curriculum development. This may be achieved by means of greater flexibility in the central establishment of syllabuses. (In the 1972/73 school year, the 3rd unified year of the first stage of secondary education took effect on an experimental basis and here some forms of curriculum adaptation at the school level were in fact included);
- definition of educational objectives, consistent with the educational system on the one hand and with each level of that system on the other. The definition of these objectives would be the starting point for the setting up of curricula and syllabuses, the foundation of didactic methodology, the guidelines of the teacher training process and of the forms of pedagogical organisation within the school;
- adoption of organisational schemes for the teaching-learning process that make possible (i) individual observation of each student, by himself and in relation to his environment; (ii) appropriate guidance procedures;
- integration, in the mechanisms of educational guidance and observation, of adequate methods for the evaluation of student achievement or objective control of their learning progress.

Objectives to be Reached through the Process of Innovation

8. The criteria just enumerated might well guide the renewal of the type of teaching-learning relations presently existing in Portugal. But they should be complemented, as has already been mentioned, by a careful reconsideration of several aspects of the whole scheme of institutional, functional and pedagogical reform of education, beginning with a definition of the goals of the innovation process.

The first point to be considered concerns the number and quality of the potential sources that may generate innovation and the possibilities created for the diffusion, evaluation, application or rejection of its results. Presently, there are few sources and possibilities: the potentiality of both appears, therefore, as a goal which should be given priority and it will be briefly analysed later in this paper.

In the second place, after the conditions required for reaching this goal are established, it will be necessary to ensure (i) that the process of innovation will be permanent and (ii) that a climate of controlled experimentation will develop in accordance with the essentially personal imperatives of educational action and with the discovery of alternative arrangements best suited to the evolution of these conditions.

Main and Immediate Factors to be Considered

9. This formulation, though necessarily abstract, may serve as a guide and a framework for the examination of some factors which seem to have a more immediate and particular influence on the generation of creativity in Portuguese schools. It is related to such institutional mechanisms as the administration of education, the position of the school in the social environment, the training and utilisation of teaching staff, research and development in the field of education, and the present role of the inspectorate.

THE PRESENT SITUATION AS CONCERNS THE SELECTED FACTORS

A. Institutional Arrangements

A Centralised System of School Administration

10. As we have already shown, the system of school administration in Portugal, as in other countries with an administrative structure inspired by the Napoleonic tradition, is based on a concentration of power and functions in central departments, situated in the country's capital city and directly dependent, even in matters of current management, upon the Government.

Members of the governmental team responsible for national education may utilise - as in effect they do - the juridical institution of delegation of power, transferring certain kinds of decisions published yearly in the official gazette ("Diaro do Coverno") to the top civil servants, who manage the central services at director-general level or corresponding rank. But the use of delegated powers does not contradict the essentially centralised nature that characterises the administration of education in Portugal.

This same centralisation is found in the administration of the various educational levels. All preparatory and secondary schools depend directly, without any intermediate link, from the General Directorates and therefore each of them has to be in touch with several central departments simultaneously(1), receiving orders and instructions from them according to their area of legal responsibility. The same pattern applies also to primary schools, although for these there is a network of bureaucratic departments at the regional level (school Directorates at the district level) and at local level (school Delegations at the council level or at school zones level, in metropolitan areas). These departments are directly subordinate to the "Direccao-Geral do Ensino Basico" (General Directorate for Basic Education) and have very limited powers.

Some other departments of the central administration have regional deputies with special responsibilities. But in spite of the intensive reform at the central level carried out in September 1971, the administrative system still reflects not only the pattern of Portuguese public administration but also the former situation in which educational resources were concentrated on pupils at the primary level and the consequent distribution of schools.

School and Social Life

11. As in other countries, preparatory and secondary schools in Portugal tend to be hierarchical. Thus the administrative structure described above is reflected in the internal organisation of the school, in which the role of the Headmaster is paramount. The

1) They are each nevertheless directly subordinate to only one General Directorate, respectively the "Direccao-Geral do Ensino Basico" (General Directorate for Basic Education) and the "Direccao-Geral do Ensino Secundario" (General Directorate for Secondary Education).

relative permanence of Headmasters in their positions, a consequence of a variety of circumstances, contributes to the hierarchical characteristics of the school.

Associated with this factor, and reflecting again the influence of institutional mechanisms external to school, we can detect a certain isolation of the school within the broader context of social life. Thus to the isolation and individualism which, as a rule, characterise the work of educational agents as a result of their training and the pattern of school organisation, we can add the segregation of the school itself within its immediate environment.

Thus there are very few parents' associations, and where they exist they have few recognised rights in relation to public educational establishments. And if this isolation exists at the level of organised and systematic relationship with the families of students - an isolation broken only by sporadic and individual contacts - it also appears in the behaviour of each school in relation to the local community and to other schools in the same area.

The Scheme for Stimulating Innovation

12. The Portuguese teacher is traditionally endowed with an "epic" quality which tends to exalt his spirit of sacrifice, the nobility of his mission so often accomplished in adverse circumstances, and the difficulties of his work with the young people. The intention of this exaltation is normally to evoke gratitude or justice. But another purpose is to call attention to what the teacher needs if he is to accomplish his mission.

In this context problems like salary structure (considered in absolute terms and in comparison with that of other civil servants), professional career, and access to permanent education or retraining processes are at present under review, and it is generally expected that improvements in these conditions will bring about improvements in the teachers' performance. Nevertheless these are not the only factors of importance in schemes for the stimulation of innovation.

13. The teacher's professional status is certainly an important factor in the context of innovation. In Portugal, there are different statuses according to the level or branch of education in which he works, whether in primary school, in preparatory school, in classical secondary school or in technical secondary school. The conditions necessary to reach the top professional category at these various levels are defined, after which the salary increases depend on the number of working years, on higher qualifications acquired in the meantime by the teacher, or on merit.(1) The qualifications demanded for the top professiona egory are those considered necessary for the full practice of teaching.

ough no material compensation is provided for such cases, the teacher is frequentl, invited, according to the educational level of the centre where he teaches, to put into practice certain innovations established by the central departments of administration, namely those resulting from the approval of new syllabuses or pedagogical methods. To this end, or in order to update teaching methods, each year the central administration launches schemes for improving the professional competences of teachers. The use of educational technology is limited except for television at the preparatory school level.

The Teacher Training Institutions

14. As noted earlier, the initial training of teachers is a contributory factor to the present position of creativity in the school. At present, the existing teacher training

1) Exception is made in cases when there is an invitation to fulfil specific functions such as the Headmaster of an educational establishment, or the methodology of teacher or assistant lecturer of the probationary training of secondary school teachers.

institutions prepare teachers for primary education,(1) for physical education(2) and for teaching the mentally handicapped.(3) The Arts Faculty provides courses in Pedagogical Sciences, attendance at which is compulsory for some categories of teacher. Towards the end of 1971, within the framework of the science faculties, a university degree in Educational Sciences was created and all the students with a bachelor's degree have access to this.

If the preparatory and secondary school teachers wish to obtain a definite status they have to carry out one year's probationary training and pass the appropriate examination. The number of educational centres where such probationary training could take place was, until the end of 1971, extremely limited; at the same time the number of teachers with incomplete initial training and, therefore, precarious status was very high. In July 1971, the number of schools equipped to provide this probationary training was increased. The year's work is carried out under the supervision of specialised staff and demands among other things the acquisition of both general and specialised teaching skills and a knowledge of school management.(4)

15. This brief description gives the idea of the paucity of institutions existing until recently in Portugal for the initial training of teachers, but it also indicates the present rate of change for the better through recourse to special solutions (for instance probationary training or intensive courses provided in the university to complete the scientific education of working teachers) or through the schemes for further qualification (such as the university degree in Educational Sciences created in the sciences faculties). In view of the fact that administrative structure and school-environment boundaries provide an unfavourable context for change, changes resulting from an integrated system of training (initial, permanent or recurrent) will undoubtedly make an important contribution to the improvement of the teachers' capacity to handle innovation.

R & D in the Field of Innovation

16. But these are not the only institutional factors affecting the creativity of the schools. In fact, the structure and function of the educational system itself needs to be the object of permanent evaluation. This can be achieved through research activities oriented towards a systematic and in-depth study of the educational process, of its nature and of the way in which it should develop within specific social co-ordinates, present and future. Although there have been a good many investigations of an experimental nature, made without the help of sufficient numbers of specialised staff and without an appropriate methodology, particularly in the preparation of new syllabuses, serious applied research and development in the field of education has, to date, been rare and confined to a few institutions only.(5) This in itself reduces the possibilities of broadening the scope of teacher training and does not enable the system to adopt properly evaluated improvements. Similar limitations are observable also in the social fields, which in one way or another have close connections with education. The problem is related to the orientation

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1) The Primary Education Teacher Training Schools, which provide 2-year courses and access to which demands a minimum of 9 years' schooling.

2) The Physical Education Teacher Training Schools and the "Instituto Nacional de Educacao Fisica" (National Institute for Physical Education) which is a short-cycle higher education institution.

3) The "Instituto Aurelio da Costa Ferreira".

4) See "Estagios Pedagogicos" (Pedagogical probationary training), Boletim da Comissao Orientadore, No. 1, 1971/1972.

5) These are the "Centro de Investigacao Pedagogica" (Pedagogical Research Centre) of the Gulbenkian Foundation, the "Gabinete de Estudos Socias" (Social Studies Centre) of the Technical University of Lisbon, and the "Gabinete de Estudos e Planeamento da Accao Educativa" (Bureau of Educational Research and Planning) of the Ministry of Educational Research.

of science policy itself. As recommended by the OECD 4th Conference of the Ministers of Science (Paris, October, 1971), priority should be given to the social sciences in view of their generally slow state of progress in comparison with the other fields of scientific development.

B. The Role of the Inspectorate(1)

The Organic Structure of the Inspectorate

17. Portugal has an inspectorate for private educational establishments and another for public educational establishments. The latter is differentiated according to educational level - primary, preparatory and secondary - and again within secondary education it is different for the classical secondary school and the technical secondary school. Leaving aside the special case of the inspectorate for private teaching, the fundamental problem to be considered here is the relationship between inspectorate activities and the pedagogical responsibilities assigned to the different central departments of the educational administration. In this field we come across different solutions for the different educational levels or degrees. These different solutions may eventually be explained by the fact that the legal provisions regarding the inspectorate were issued at different times and were therefore guided by different notions about its activities. Inspectors are either gathered together, with autonomy (as is the case for preparatory education) or without it, in the General Directorates, or form separate groups whose heads report directly to the Minister of Education. In this latter case, which applies to the inspection of classical secondary schools and private teaching, the relations with the corresponding General Directorate are defined in terms of "collaboration".

18. Inspectorate activities are normally conducted from the capital city, exceptions being the inspection of primary schools (which involves school district directorates and council delegations) and of preparatory education (which is based on geographical areas). The inspectorate for preparatory education was established only recently to cover the area corresponding to the old compulsory post-primary level. This re-constitution makes good some of the deficiencies of the previous system.

The Activities of the Inspectorate

19. One of the greatest problems of the present inspectorate is to strike the right balance between giving guidance, administration and disciplinary supervision. The predominantly repressive nature of control and supervision activities is incompatible with the approach required when guidance is being given. Indeed, the reserve and even mistrust with which the control function is regarded actually impairs the efficacy of pedagogical guidance which, after all, should be the most important activity of the inspectorate.

Nevertheless, it is not always easy for a single individual on the inspectorate staff to fulfil both functions efficiently. It is also relevant that the disciplinary activities, being more strictly regulated, more pressing and yet slower-moving, take more of his time than pedagogical guidance. To overcome these disadvantages, at least at preparatory education level, distinction is made between the two activities and some inspectors have been assigned chiefly to duties of a disciplinary nature.

Additionally, there is a disparity between the functions ascribed to the inspectorate and the number of inspectors actually available to carry them out. This contributes to the

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1) A more detailed description of organisation of school inspection in Portugal can be found in "Notas sobre a situacao da inspeccao do ensino na Metropole" (Notes on the situation of school inspection in metropolitan territory) by SILVEIRA, Luis L., IE/B/72.1, GEPAE, Lisbon, June 1972.

limited development of pedagogical guidance activities, which, with some emphasis, is legally assigned to the inspectors and from which so much could be expected in the way of strengthening the schools' capacity to deal with innovation.

The Career and Recruitment of Inspectors

20. The minimum requirement for entry to the inspector category is to have been a teacher at the relevant educational level. Only in relation to the guidance functions do inspectors of primary education need to have previously attended special courses. Appointment of inspectors is generally by ministerial choice. This system is detrimental to the creation of a career structure in the service because it does not allow for any legitimate and reliable expectations of promotion to the teachers most qualified for the position of inspector.

Normally inspectors remain in their appointments for periods of three years, which may be renewed indefinitely. This system has the disadvantage of insecurity because, if the three years' tenure is not renewed, the inspector returns to his former position of teacher. Such insecurity may adversely affect the independence necessary for carrying out the inspector's job. On the other hand, the system in force has consequences which do not correspond with the purpose for which it was established. Thus, most of the inspectors remain in their appointments for successive periods and in this way their situation becomes permanent in as much as the remuneration for the inspection functions consists of a monthly gratuity added to the teacher's salary. However, this gratuity will only be paid in full if the inspectors perform a minimum of 15 days' external service each month.

In many respects, this system will undergo major changes as a result of the reform of the central structures of the Portuguese Ministry of Education which took effect in September 1971.

FUTURE ARRANGEMENTS AS THEY CONCERN THE SELECTED FACTORS

A. The New Structures

The Administration of Education

21. It will not be easy to initiate, nor even to contemplate with a minimum degree of reality, a system of administration of education in Portugal radically different from the one that is presently in force. It is however possible to make the existing pattern work, within the respective legal framework but in a rather different manner, if its full potentiality is explored to its very limits or its most promising lines are developed to their full extent.

In fact, bearing in mind contemporary trends in public administration based on a strong executive power, we find that the adaptation of that principle to the Portuguese case has been characterised by a certain opening of boundaries between the political and the executive and between the administrative and the executive. However, there seem to be traditional and sociological factors that militate against the possibility of a radical separation between the two types of executive power or the adoption of a high degree of functional and territorial autonomy, as in the case, for instance, in some Anglo-Saxon countries.

This being so, some possible ways of improving the administration of education seem to be: re-shaping its central structures in accordance with the principles of horizontal functioning;(1) the progressive withdrawal of the overload of current management matters

1) Recent examples of this kind of change are the reforms carried out in the French and Spanish Ministries of Education and later in the Portuguese Ministry of National Education.

that presently encumbers the work of the governmental team for national education; and finally the territorial decentralisation of power with regard to specific issues to the regional level. On the other hand, and as a guideline for administrative action, it is important that there should be a distinct improvement in communication between the centre and the local and regional school authorities and, even, communities at large. Keeping the latter informed is necessary so that the improvement in schools may be assisted by participation from outside their walls.

22. As mentioned earlier, the reform of September 1971 in the central structure of the Portuguese Ministry of National Education tried to take these criteria into account or at least to open ways that might make possible an evolution in that direction.

The law, by replacing a purely vertical structure with a horizontal organisation of services, has introduced a change of a limited nature; but it stresses the fact that it had been possible "to take a major step forward by separating the scientific, pedagogical and disciplinary problems of education - which have been handed over to the general-directorates of education - from the technical aspects of staff, installations and equipment and administrative and financial management, which are to be dealt with by a general-directorate of school administration".(1)

On the other hand, the same law admits that "education cannot fail to keep pace with the efforts that are being made to regionalise the territory of Portugal in Europe. Apart from the administrative advantages and improvement of management arising from rational geographical decentralisation, educational work should fully share in regional development through responsible, appropriate bodies".(2) To attain such a goal the same law states "that as regards the organisation and functions of the educational system, Portugal will be divided into areas based on educational needs", and that in each of these areas "organs and external departments of the various general-directorates necessary will be set up as needs indicate".(3)

23. Thus the administrative regionalisation of Portuguese education will be a long process as, in a sense, it goes against tradition. Nevertheless, a great deal is expected from the role to be played by the regional administrative structures in their communication with the schools and local communities and in their articulation with the institutions of teacher training and with the schemes of pedagogical inspection and guidance.

Teacher Training

24. Within the framework of the new plan for Portuguese education published in January 1971 the future of teacher training raises some points for discussion. For instance, primary and pre-primary teacher training in the new proposals relate to the level of the last stage of secondary education, although in the meantime there has been a growing hope that the respective courses will be of three years(4) instead of two, as they are at present, and that the number of school years necessary for access to those courses in future will be 10 instead of 9. It is maintained, however, and this is acceptable as a principle, that those courses should be raised to the post-secondary level as "a better solution to secure qualifications for the new type of teachers required to reorganise and modernise the corresponding schools".

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1) See "Lei Organica do Ministerio da Educacao Nacional" (Organic Law of the Ministry of National Education). Lisbon, Impresa Nacional, 1971, page 15.

2) Ibid., page 12.

3) Ibid., pages 20 and 21.

4) "Sugestoes para una reforma das escolas do magisterio" (Suggestions for the reform of teacher training schools), IE/A/72.1, GEPAE, June 1972.

Practical reasons and the need for a great number of teachers(1) for the next 4 years within compulsory education (which will be of 8 years as from 1974/1975) may have contributed to postponement of the decision to provide post-secondary training at this level; but the difficulties could be solved, perhaps more realistically, by the adoption of a new status for basic and secondary education teachers. If the latter were paid on the basis of academic and professional qualifications, and not on the level of the school where they teach, as happens at present, the primary teachers might be stimulated to obtain higher qualifications which would command better salaries without their having to stop working at their present level of education. In this way it would be possible progressively to refresh the primary teaching staff.

25. This proposal is of the greatest importance because it would have far-reaching consequences. All basic and secondary educational agents would be encouraged thereby to obtain degrees or academic qualifications or to devote themselves to more rewarding research and development work. A teaching career outlined according to this pattern might eventually become a powerful instrument for developing the capacity of the teachers themselves to deal with creativity and innovation, despite the practical difficulties of its implementation.(2)

The principal institutions for teacher training provided for in the projected Portuguese educational system are the Higher Teacher Training Colleges. Their purpose will be to "train students to be teachers in the first stage of secondary schools",(3) which, according to the proposals under consideration, will correspond to the 4 years of post-primary compulsory education, and will have, just as universities, the power to confer the bachelor's degree. The Higher Teacher Training Colleges will most probably be the future teacher training schools for all the basic education teaching staff and may thus have an important role in the framework of regional educational activities.

26. There are many ideas(4) about the role to be played by these Higher Teacher Training Colleges. Besides being oriented towards the initial training of teachers, they are also expected to implement the results of applied research and development, to co-operate in the retraining and permanent education of teachers, to co-operate in the pedagogical guidance of the schools in their own geographical areas, to be receptive to the local educational and cultural necessities and finally to assist the regional bodies in the administration of education. It has even been stated that these departments "together with the pedagogical complexes formed by the various Higher Teacher Training Colleges may, in future, be the leading centres, facilitating the adoption of a new, decentralised and more humane Portuguese educational system".(5) In this way they would assume a fundamental importance in Portuguese educational development in the present decade.

Meanwhile, in each university, Institutes of Education will be set up, where those who have already obtained a bachelor's degree in university or non-university courses may

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1) At present compulsory education in Portugal is of 6 years. See "Provisao do Pessoal docente para o sistema escolar portugues" (Estimates of teaching-staff for the Portuguese school system), IV P.F. 9. GEPEA, May 1972.

2) See "Matrizes do pessoal docente dos ensinos basico e secundario" (Matrices of basic and secondary teaching staff), ER/C/72.1, GEPAE, September, 1972.

3) See "Projecto do sistema escolar" (Projected educational system) Lisbon, Ministry of National Education, January 1971, page 11.

4) See "Sugestoes para um projecto de criacao das Escolas Normais Superiores" (Suggestions for a project concerning the establishment of Higher Teacher Training Colleges), IE/A/72.2, GEPAE, July 1972.

5) See "O IV Plano de Fomento (1974/79): principais objectivos da politica de valorizacao dos recursos humanos" (The IV Development Plan (1974/79): its main purposes to perform the revaluation of human resources policy), IV P.F.I., GEPAE, November 1971, page 30.

obtain a higher degree which will entitle them to teach their subjects in secondary schools without any further training. These Institutes of Education will work closely with the National Institute of Pedagogy which is also to be set up and will probably be a centre for research in the educational sciences.

27. The Higher Teacher Training Colleges as well as the Institutes of Education will thus be that part of the structure of higher education conceived as being "an interrelated system of institutions which, while pursuing very different and specific aims will, however, adjust to one another through appropriate functional relationships".(1)

The existence of efficient structures for the initial training of teachers will be no means be sufficient to guarantee the type of teacher required by a "creative" conception of education. Just as important, surely, will be the mechanisms of retraining, guidance and permanent assistance, as well as an adequate policy for employing those teachers in a career of a new pattern. It will also be necessary that the whole scheme whenever possible should have a markedly regional character. This would be achieved through the progressive dissemination of Higher Teacher Training Colleges and more local centres of assistance for teachers.

The Development of Research

28. It is hoped that in time a new process of Research and Development in the field of education will develop. On account of their university location, the Institutes of Education together with the National Institute of Pedagogy will naturally form privileged centres of fundamental and applied research and thus help to strengthen the innovation-generating sources. Five of them will be set up on an experimental basis during the 1972-73 school year.

But the main problem is not the number and quality of research centres. Research should be a preoccupation running generally through the whole educational system. Classical problems of science policy, like the existence of a "critical mass" in research teams, the selection of subjects and projects that should be given priority according to observed needs, participation in a climate of confrontation, dialogue and international exchanges in this field, seem to be some of the indispensable conditions if these R & D activities in the field of education are to be productive. It is equally important to give effective distribution to the research results and to ensure that the research and development activities of the Higher Teacher Training Colleges make a lasting impression on the teachers trained and assisted by them.

Finally, we must not lose sight of the fact that R & D in the field of education should be a part of a broader social sciences research programme that can be expected to provide much fundamental data of relevance to the strictly educational research.

B. A Possible Pattern for the Inspectorate within the New Structure

29. From what has been said already, it will not be difficult to imagine what shape the inspectorate should take in relation to the new structures of education and of teacher training.

As far as its organic structure is concerned, the new central organisation of the Ministry of National Education requires that the functions of inspection and pedagogical guidance of public schools be incorporated in the General Directorates responsible for those schools; as to the private schools, these functions will be carried out by the same departments but in collaboration with the General Inspectorate of Private Education, which

1) See "Linhas gerais da reforma do Ensino Superior" (Guidelines of the reform of higher education), Ministry of National Education, January 1971, page 6.

continues to have autonomy and some, although fewer, specific functions. However, the way in which the inspectors will carry out their functions within the framework of each General Directorate is still to be defined. In this connection it should be stressed that if such incorporation "may be helpful to secure the desired unity of action in each of those departments, through the interrelation between the executive and management tasks and those of inspection and supervision", it may, on the other hand, "hinder the indispensable independence of the inspection services which will not easily tend to discuss the faults of the administration to which they belong".

30. There are two ways in which this difficulty may be circumvented. First, in the reform of the Ministry of Education a body of inspectors in the National Board of Education was set up with responsibilities for, inter alia, "far-reaching and delicate functions". This body could act, if necessary, as a court of second instance for inspectorate affairs. The second way is for the inspection services of the General Directorates to create new departments with their own authority and structure.

Finally, a third solution could be found for the difficulty if, besides putting a greater stress on their functions of pedagogical guidance, some inspectors were directly attached to the regional departments of the administration of education and worked in collaboration with the teacher training centres, that is the new Higher Teacher Training Colleges.

As to the duties of the inspectorate, it is important to note that the function of administrative and financial supervision was, by the above-mentioned reform, entrusted to a new General Directorate of School Administration. This gave the inspectors some relief from activities for which they had not been fully prepared. But when the educational General Directorates were given the functions of pedagogical guidance and inspection as well as of disciplinary action, it was not made clear whether "these functions will continue as a responsibility of the inspection services". If they will, it might be appropriate to allocate the functions of guidance and those of a disciplinary nature to different individuals.

31. Lastly, with regard to the recruitment of inspectors and their career, it is necessary to dignify the profession and to train its members, particularly in the pedagogical field, in order to ensure an appropriate relationship between the inspectors and the teachers. This would not only render the inspector's career more attractive, but it would qualify those who wish to leave it for a career in teaching.

This might eventually open the way for a more efficient guidance-inspector career. He would be entrusted with greater powers for pedagogical intervention, making it possible for him to become an effective agent for the dissemination of innovative projects. It would connect him more directly with the regional life and administration and with the teacher training institutions, without, however, hampering his independence, and it would progressively relieve him of disciplinary functions. The replacement of the supervisor-inspector by the guidance-inspector may not exclude the existence of disciplinary and administrative and financial supervisors, but it would certainly help to reshape the personality of the inspector, making him an important factor of evaluation, control and stimulation of the educational process in each school.

And taken together with the other measures suggested, by this means too it would be possible to advance gradually towards the flexible functioning of the articulated network of structures and agents, which are the fundamental factors of creativity in the Portuguese schools.

IX. INSTRUMENTS FOR THE PROMOTION OF CREATIVITY IN SCHOOLS IN THE FEDERAL REPUBLIC OF GERMANY

by

Hans Georg Rommel
Educational Planning Unit, Federal Ministry of
Education and Science, Bonn, Germany

1. The purpose of this paper is to survey the instruments and methods of educational planning available in the Federal Republic of Germany for the promotion and stimulation of "creativity" within the school.

The basic structures of responsibility in the school system are set by two factors:

- The federalistic system. Responsibility for the school system lies with the individual states (eleven Länder); they regulate standards, organisation, curricula etc. The teachers are civil servants of the Land. The communities bear part of the cost of building and non-teaching staff, the proportion of state aid differing as between the Länder.
- The state school system. Schools are, as a rule, public institutions, with teacher qualification-requirements, subjects to be taught, examinations and qualifications, maximum cost of equipment, number of pupils per form and such like being subject to uniform state regulations. Additionally there are some private schools and most of these conform to the same regulations with respect to official approval and state aid. "Model Schools" and "Experimental Groups" increasingly deviate from the standards set, state approval being given in each individual case. On the pedagogical side, however, the individual teacher has considerable freedom of choice in matters of curriculum, materials, methods and assessment provided this is exercised within the statutory "subject matter guidelines" and the set number of periods per subject.

2. In the field of educational planning and research (understood to include innovation experiments and evaluation), the Länder may call for co-operation and support from the Federal Government (Bund).

In addition to the Länder administrations and the various planning agencies or instruments set up to further the purpose of any individual Land, there are various bodies for planning and co-ordination on the national scale, namely:

- The "Deutscher Bildungsrat" (Education Council, BR), an independent national advisory body for Bund and Länder;
- The "Ständige Konferenz der Kultusminister der Länder" (Permanent Conference of the Land Ministers of Education and Cultural Affairs; KMK), the main instrument for ensuring national coherence through inter-Länder co-ordination;
- The "Bund-Länder-Kommission für Bildungsplanung" (Bund-Länder Commission for Educational Planning; BLK), a body combining the ministers responsible for matters of education at both levels. This was set up in 1970 to intensify co-ordinated educational reform, its main assignment being to draft a development plan for

education up to 1985 (including cost and financing) for presentation to the heads of governments (Federal Chancellor and 11 Prime Ministers) for approval.

Infrastructure for Innovation and Creativity

3. The following may give some indication of the main functions of these bodies as they concern the "creativity of the school":

a) The BR gathers top level independent expertise on education - which is bound to include educational policy thinking - and presents it in the form of recommendations on overall structural and organisational development. In years past these recommendations have proved to be the main starting point for reform programmes and projects. At present the issues of "democratisation" (in the sense of participation of different groups in decision-making) and "creativity in the learning process" are at the centre of the BR's deliberations.

b) The BLK tries to assess these proposals, together with possible alternatives, from the point of view of administrative and policy responsibility, feasibility and financing, and translates what has been accepted into measures, quantities, and time-tables. It seems that the BR advisers favour the idea of basing reform strongly on the teachers and the individual school, whereas the planning and administration experts of the ministries in the BLK and its committees are more inclined to give central administration the larger share of initiative.

c) Co-ordination of administrative measures concerning school organisation, curricula, examination requirements etc. is mainly carried out in the KMK. The individual Länder have increasingly set up experiments and curriculum development projects, being stimulated by general public demand for reform, BR recommendations and the new discussion of reform programmes in the BLK with the added attraction of financial support from the Bund. Some Länder have recently put forward draft bills that are intended to ensure greater participation of community, parents, pupils and teachers in educational policy.

d) Additionally, there is considerable activity by some community councils and administrations in the field of innovation experiments.

e) Several years ago the initiative of individuals or groups of citizens led to the establishment of special experimental schools; in the meantime such initiatives focus their activities rather on particular issues of the general system (e.g. "smaller classes for the smallest pupils!").

4. Generally speaking, it seems that the "creativity" issue today is being pursued by the "professionals" - planners, scientists, teachers, administrators - rather than by the public. It is viewed within the context of general aims of reform, such as: secondary education for all; co-ordination and combination of the so-called "general" and "vocational" curricula in upper secondary and vocational education; expansion and improvement of pre-school education; how to achieve reform of structures and curricula; What is the role of scientific research institutes?; How are the programmes and projects to be organised and administered - centrally from the administration, or with a great deal of local autonomy?

These problems and questions are reflected in the work of the BLK Committee for Innovation and its activity in the promotion and co-ordination of innovation experiments. These experiments cover the full range of reform issues, from pre-school education and integration of the handicapped to courses leading to a combined vocational and university entrance qualification, from socialisation questions to new methods of achievement control or the use of educational technology in self-study programmes. In the design and the

execution of the projects, scientists, teachers, planners, government and community administrators are involved. Whereas activities that were understood to carry the threat of jeopardising Länder autonomy (such as the establishment of a national institute to co-ordinate and administer curriculum development) failed on the grounds of the constitutional policy issues involved, the programme for innovation experiments has expanded considerably and has contributed to increasing as well as structuring innovation activities.

Educational Experiments and Innovation

5. The basic structure of the experimental system is as follows:

In May Bund and Länder signed an agreement on the joint financing and co-ordination of educational experiments. The BLK charged its Innovation Committee (IC) with working out the details, reviewing the proposals submitted for support by the authorities (i.e. in most cases one of the Länder) and making a recommendation as to federal support which, as a rule, amounts to 50 per cent of the special cost ("innovative plus") of the experiment or model. In the IC, the Bund has 11 votes, each of the 11 Länder has one. In matters of individual project applications, however, the final vote is usually unanimous. Formally, the decision of the IC is not binding for the Bund, but de facto the Federal Ministry for Education and Science has always accepted the decisions, for it carries the Bund votes, has the funds purpose in its budget, participates in the discussions and voting procedure and in cases has by indication of interest stimulated certain of the project applications. next year it is expected that review of the applications on the Bund side from the point of view of budgetary regulations will be completed before discussion in the IC, so that approval there - which can only come about with the 11 Bund votes - will also be formally binding in principle as well as in amount.

6. A special Working Group for Innovation Models (WG-IM) was set up by the IC to pre-screen the applications and, more important, to define certain areas or issues of special interest for experiments. The main basis for that definition was furnished by the so-called "Interim Report on the Development Plan for Education" of the BLK. This report contains the basic structural aims (together with the ensuing quantifications and financial demands until 1985) on which agreement had been reached, e.g. expansion of pre-school education for the five-year-old; secondary education ("scientifically oriented basic education") for all members of the 10 - 15 age group; closer co-ordination and interlinking between the so-far separate systems of general and vocational education for the 16 - 18/19 age group in organisation and curricula. Many questions of operationalising these aims, and also some basic issues, however, were left open - for example, "pre-school for the 5-year-old" as part of Kindergarten or as first year of a new, two-year "introductory stage" of primary school? "Secondary education for all" for the 10 - 15 age group in comprehensive schools or through a set of changes within the three-tier system?. Model experiments, then, were to serve further clarification. Some of the issues to which answers are sought in such experiments are:

- Kindergarten versus 2-year "introductory stage" at primary school for 5- and 6-year-olds;
- comprehensive schools for the 10 - 16 age group;
- various types of "comprehensive junior college" for the 16 - 18/19 age group (general cum-vocational);
- integration of the handicapped into general schools;
- reform of vocational education and training by restructuring organisation and curricula (basic training for a larger "vocational field" first, followed by increasing specialisation).

7. These examples show an interest in organisational concepts or general principles rather than concrete problems of curricula or content. In a federal system they must, of course, leave room for different kinds of implementation because the basic responsibility for education rests with the individual Länder. What complicates things further is differences of opinion and interest in educational policy between the Bund and the Länder and, in other cases, differences between the policy views of governments supported by the social democratic and the liberal democratic parties (Bund and six Länder) on the one hand and those of governments supported by the Christian Democratic party (five Länder) on the other. Nevertheless, co-operation and discussion of project areas and individual projects have led to a large area of common ground, including basic criteria for technical details, questions of content and priorities among the experts who - as members of their respective ministries where they are in charge of the execution themselves - sit on the working group and in the committee. As a rule, they all have a firm background of personal experience in teaching as well as planning and administration.

8. Each experiment is to be accompanied by an evaluation project, preferably to be carried out by scientists and teachers in co-operation. Assessment of these projects for the IC was at first assigned to a special working group that consisted mainly of educational scientists nominated by the ministries. Practical questions of co-ordination as well as, probably, basic differences of outlook between the "scientific interest" and the "educational policy and innovation interest" led to a change, and now evaluation projects are discussed by the first working group as well, together with the experimental project that is to be evaluated, scientific expertise being called in on an ad hoc basis. It should be kept in mind, however, that this is a procedure of reviewing projects for the purpose of recommending them for federal support. Before the project - experiment or evaluation - comes up for review, it is worked out on the Land level, all Länder having already developed a system to ensure scientific expertise in working out and executing experimental and evaluation projects.

The latent conflict - typical of all policy planning processes within parliamentary systems - between experts and administrators on the one hand and representatives of parliamentary responsibility on the other, has led in some Länder to the situation that federal co-financing for each individual project must be approved by the Prime Minister's office and/or a parliamentary committee.

Experimental Groups, Instead of Individual Pilot Schools

9. The authority of the Länder in educational matters is thus acknowledged and maintained. On the other hand, there is a general interest - shared by the governments as well as educational reformers such as those gathered in the "Deutscher Bildungsrat" (National Advisory Council on Education; BR) - in ensuring overall reform on the basis of nation-wide comparable experiments. The BR-proposals for a large series of experiments with comprehensive schools and with full-day schools (at least 40 each) foresaw somewhat autonomous individual institutions operating within a rather wide and flexible framework of regulations for organisation and curricula. The schools that were started under the programme in 1968/69 have in fact maintained a good deal of this philosphy and self-interpretation. As a matter of fact, it is more compatible than often thought with the alleged "authoritarian" structure of the traditional German school system, since the so-called "framework regulations" for curricula are so vague as to leave the school, or rather the teacher, a wide field for individual implementation; furthermore, the traditional public administration staff limited itself to the more formal aspects of supervision.

10. The hopes that these isolated, rather autonomous schools would develop into master patterns for copy were unfulfilled, however, and the same goes for the hopes that new institutes would soon provide the material for a thorough reform of curricula. Tremendous energy was invested in the production of smaller curriculum units, but development was largely isolated, often without full knowledge of recent developments in learning psychology and curriculum research. In some cases, the "pilot" aspect of the model schools made them focal points of social policy issues and thus the object of general political controversy or of conflict between administration and teachers. Successful developments and experiences remained without influence beyond the individual institution, since there was no developed system for dissemination. Whereas these schools aimed at a complete structural reform (mainly comprehensive education), another set of experiments was started by some Länder to try out certain individual aspects of reform in a group of existing institutions, without a complete change of structure and content (e.g. the Mainz model for upper secondary general education). From the Hessen experience in curriculum development it seems that one way to assure regional co-operation in curriculum development - rather than "grass-root" work at each experimental school - is not to make funds for that purpose available to the individual school but to regional groups.

11. The main point of the above remarks is that, on the basis of these experiences, the Länder administrations tend increasingly to move away from the individual pilot school concept to that of a regionally co-ordinated "experimental group". It is hoped that this will allow for a more economic strategy of financing and for a quicker dissemination of innovation through the system as a whole. Special attention is given to ensuring a greater participation of teachers, students and parents in this scheme.

12. The regional systems that are now developing differ in a number of details, and some of these differences may again be due to the interplay of interests and educational policy principles of the social groups concerned and of government and administration. It is difficult to say, in any case, which system would be best to yield more "creativity of the school" in a complex interplay between political climate, administration, community, teachers, pupils, parents and scientists. The Federal Republic seems to be at present at a stage where two basic lines of thought and experience in other countries are important factors: first, the Swedish idea of innovation in blocks or comprehensive units, under a strong centralised administration and with curriculum development organised in stages (frame set by policy authorities; detailed curricular guidelines worked out by school administration, scientists, and teachers; material worked out by publishers). Secondly, experience from the United States that complete "package" curricula "handed down" to the teacher, be they ever so good, will be ineffective with regard to innovation and motivation.

Emphasis on Regional Structures

13. In the Federal Republic, any kind of innovation entre independent of the administration would be unlikely to succeed. The real question then, is how "block development" and curriculum construction should be set in the network of responsibilities and interests. The following are some of the operating procedures employed at present:

- the regional system is run and co-ordinated by the administration through a special institute that is integrated into the administration (Bayern, Centre for Educational Research, under Education Ministry);
- control of the regional system is by elected representatives of the participating teaching staff (new BR draft proposal for large-scale model kindergarten and pre-school education programme);

- administration co-ordinates and operates the system through appointed development groups of teachers (with a smaller nucleus in charge of each group), without an interim agent such as a dependent research institute (Hessen, comprehensive schools);
- administration staff gives general guidance and initiative, teachers participating in experiments have a certain share in development and control (Nordrhein-Westfalen, new co-operation model for comprehensive school development);
- administration gives schools participating a wide remit of autonomy in the development and choice of curricula in a first phase, hoping in a second phase to ensure selection and transfer of results through a system for centralised evaluation and dissemination (Baden-Württemberg "pilot" schools; Niedersachsen at present, though about to be revised);
- administration appoints mixed groups of scientists and teachers for curriculum development; these curricula are then adopted and integrated in the schools through "self-experience teams" of teachers (Hessen).

14. In some Länder these procedures are used in different combinations. The following, however, may be said to apply to all the systems at present in use in the Federal Republic.

- One no longer expects complete, comprehensive curricula developed by research institutes as a short- or even medium-term solution. This seems to correspond with the international fate of the idea of the teacher-proof curriculum and to favour a system of "aids for choice and individual structuring" - the sciences being a possible exception.

- Independent of, but in parallel with, the regional development projects, the issue of new structures for participation in the individual school is gaining importance. For several years there has been a general trend towards greater contact and co-operation between teachers, parents and pupils - not only in general school life, but in teaching subject-matter also. In several Länder the staff of the school have received considerable rights and powers in relation to the Director, who is the traditional administrative head and supervisor (all teachers are, as a rule, civil servants). In some cases of model schools the experiment includes replacing the Director by a team, though only in two instances has the personal responsibility of a Director been absorbed into the full collective responsibility of a team. One Land, Niedersachsen, has specifically authorised model schools to work out a constitution of their own, which may allow for greater co-determination of the staff and even replace the Director, traditionally appointed for life, by a Head elected for a limited tenure only. In three Länder, draft bills are being discussed in parliament which foresee a role for parents and pupils as well as for teachers in determining the school's policy. It must be said, though, that larger co-responsibility of pupils has not resulted so far in markedly more intensive participation by the pupils. Some critics attribute this to a lack of substance for co-determination, particularly with regard to the school budget, which is laid down annually, in great detail and with correspondingly little flexibility, by the state or community administration. The reasons seem to be more complex, however.

- All regional systems are in one way or another linked with the central planning (and administrative) authority of the Land. Local school administration, on the other hand, is not always brought into the system with the same consistency.

- Particular emphasis is laid upon the intensification of further training for teachers. The main system used at present is the traditional one of special several-day courses.

- For the special issue of innovation, curriculum development and structural changes, it has become general practice to appoint special "moderators". These have no formal

function in further training, but they organise the flow of information and documentation, and they often hold key positions in regional groups for curriculum development.

- In the regional systems, both framework-curriculua and units worked out in detail are being developed and tried out, usually by mixed groups of scientists and teachers at model schools.

- Everywhere an urgent need is felt for a system of documentation and information within each Land as well as at national level. However, steps to translate this need into reality have so far been quite modest.

- The relationship between regional systems and scientific institutes is as yet uncertain. Where these institutes are part of or directly dependent on the administration, they are usually charged with evaluation. In one case, a special project group has been set up at a university which also develops the foundations for curricula. In general, however, the main link that ensures the application of recent research results in experimental projects is provided by the scientists' and the younger teachers' (who have just finished their university training) co-operation on the projects.

15. The general tendencies may thus be summarised as follows:

Emphasis is changing to regional projects. They are operated by regional development groups, usually composed of teachers and scientists - sometimes under the control of representatives of the administration or of members of a research institute within the administrative structure, rarely under the determining influence of the teachers themselves. The system calls for regional documentation and information services that are only just beginning to develop. It further calls for more open forms of school organisation with a greater share of co-responsibility for the teachers, in certain cases also for pupils and parents. It calls, finally, for the systematic introduction of the teachers to innovation through further education - in practice mostly through short-term special courses, in some cases also through "self-experience teams".

The management structure of regional teams thus ranges from a rather rigid control by the administrative planning authority to a high degree of autonomy for the individual group. From experience available it is difficult to say whether the one or the other is more likely to succeed. Success appears to depend as much on the setting of the group within the whole interplay of educational policy interests. Experience seems to indicate that innovation via administrative control can efficiently be brought about where teachers and policy makers agree on the policy principle that innovations aim at improvements within the basic structure of the existing educational system. Where the policy aim is to challenge those basic structures as such and to find new ways and goals, a system combining administrative initiative and responsibility with a wider remit for responsibility of the project groups themselves seems to have better chances.

X. CREATIVITY OF THE SCHOOL: A STATE EDUCATION DEPARTMENT'S LEADERSHIP

by

William A. Shine
New Jersey Department of Education,
Trenton, N.J., U.S.A.

1. This paper will describe the experiences of a State department of education in attempting to create a climate of acceptance for innovation. Its content deals with educational management at a level relatively remote from the student. In my judgement the process of administration of public education must be creative at all levels of a democratic State. If the administrative process maximises the involvement of persons who have a direct interest in the outcome of a decision then it can fairly be termed creative. Creative administration which utilizes the pragmatic impulses of a constituency encourages innovation by modifying fears usually associated with change. This paper is concerned with some examples of this process.

2. In the United States, management of public education is the responsibility of State government; in most States, this authority flows to local school districts. The theory behind delegating this control is that local district boards are responsive to the concerns of the parents and residents served by the school district. In New Jersey local control of school districts is as strong as in any other State. While the State Department of Education is primarily charged with the overall responsibility to ensure that schools are managed in accordance with State statutes and the rules and regulations of the State Board of Education, the present Commissioner of Education, Dr. Carl L. Marburger, has actively used his office to encourage innovation and creativity in local school problem-solving.

Local boards of education make the fundamental staffing and budgetary decisions necessary to manage schools. Locally raised taxes substantially support a community's schools, whose budgets are 78 per cent financed by local tax dollars. In New Jersey, where school financing relies heavily on property revenues, many local district taxpayers express their resentment at spiralling school costs by regularly voting against school budgets and educational issues.

In the words of Colorado's Commissioner of Education:

> What the people are telling us basically is that they want some proof from the educational system that it is doing what it is supposed to do. They want to see a relationship between the money they put in, the time their children put in, the expertise that the educators put in, and the human beings that result.(1)

The Project "Our Schools"

3. In an effort to respond to the public's demand for accountability in establishing goals and setting priorities through an open, co-operative public process, the Commissioner

1) Donald D. Woodington, "Accountability from the Viewpoint of a State Commissioner of Education", Phi Delta Kappa, vol. LIV, No. 2 (October, 1972), pp. 95-97.

of Education asked the State Board of Education to initiate a massive programme of community involvement in educational decision making. Known as "Our Schools", this project sought to stimulate discussion of educational goals among all segments of New Jersey's citizenry. The idea that emerged from State-wide, regional and local conferences and meetings resulted in the establishment of "process" and "outcome" goals for education in the State of New Jersey. A major product of the "Our Schools" project was a replicable system for achieving community involvement which could be used by local districts as they in turn developed local educational goals. The Department of Education is currently working on performance criteria which will eventually ensure that the work of the Department is directly responsible to the goals developed by the "Our Schools" project and adopted by the State Board.

Educational Assessment and School Improvement Programme

3. Results of a public opinion survey conducted as part of the "Our Schools" project indicated that the overwhelming concern of New Jersey citizens was with the school's ability to teach basic cognitive skills in obtaining information, solving problems, thinking critically, and communicating effectively.

4. Another major concern of the public and the legislators was with the assessment of educational programmes. In the United States the standard pattern of school assessment or evaluation rests upon certain rarely-tested assumptions. A major challenge to these assumptions appeared in the 1966 Coleman Report, in which exhaustive research was unable to demonstrate any statistically significant relationship between standard quality indicators and the success of a learner.(1) Although this report has never formed the basis of serious study by the professional educational establishment, its thesis has been supported in a new study by Christopher Jencks, which maintains that schools have few long-term effects on the later "success" of those who attend them.(2)

This study is especially damaging to proponents of increased educational expenditure because it characterises the American school as having only a marginal impact upon raising an individual's socio-economic status. The public asks somewhat simplistically: "Why don't we test the skills of the students to determine the adequacy of the programme?" The profession has generally replied defensively, without further explanation, that the problem is much too difficult to be analysed on the basis of testing. Yet the American school is constantly using test data in a somewhat secretive fashion to make fundamental decisions affecting the lives of young people. For example, the Scholastic Aptitude Test, now taken by the majority of teenagers, has become the equivalent of the famous British 11-plus examination. The New Jersey Commissioner of Education believes that the only information that should be denied the public is that information which will do harm to innocent individuals. Certainly mean test data regarding the level of performance of various school districts can be intelligently interpreted to the citizens of one of the world's most highly developed societies. Consequently, New Jersey has embarked on an educational assessment programme which will eventually employ sophisticated psychometric techniques available to measure the progress of the State's educational programme.

1) James S. Coleman, et. al., Equality of Educational Opportunity, two volumes, Washington, D.C., Office of Education, U.S. Department of Health, Education and Welfare, U.S. Government Printing Office, 1966.

2) Christopher Jencks, et. al., Inequality: A Reassessment of the Effect of Family and Schooling in America, New York, Basic Books, Inc., 1972.

The first phase of this effort will be the testing of all of the fourth and twelfth grade students in the State's public schools, to measure their competence in reading and mathematic skills offered as part of the school systems' instructional programme. E.L. Thorndike's lament, "It is the vice or misfortune of thinkers about education to have chosen the methods of philosophy or of popular thought instead of those of science,"(1) is as valid in 1972 as it was in 1924. There is a pervasive fear on the part of the State's teachers that public knowledge of test scores will result in loss of professional status by individual teachers. The scoring system developed in New Jersey's educational assessment programme was developed in recognition of this often well-founded fear that traditional norm-referenced scores would be used to judge the effectiveness of individual teachers. More important even than the initial testing will be the large-scale information campaign directed to both professionals and non-professionals and designed to raise the level of general knowledge regarding the proper use of testing in educational assessment.

5. The major goal of the programme will be to locate school programmes operating within similar socio-economic situations that demonstrate significant accomplishment. To achieve this, each school district in the State will be categorised and rated on correlates of achievement. These correlates of achievement reflect socio-economic conditions within the school district and are based on the hypothesis that social class affects educational progress.

In an effort to allay the fears of teachers and parents that students might not be tested on material covered in their schools' curricula the Department undertook a massive programme of teacher involvement in the preparation of the test items. To ascertain the content of the State's math and reading programmes the Department of Education divided the State into its 21 counties and directly involved 9,000 teachers considered by their local administrators to most adequately reflect a knowledge of the subject matter taught in their respective school districts. (However, the administrative selection of the teachers impugned the integrity of this process in the eyes of the leadership of the teachers' association). These teachers reviewed a test item bank developed by Educational Testing Service to determine the appropriateness of each item to each district's curriculum in the judgement of the individual teacher.

The testing took place on 14th November, 1972 under the direction of State trained test co-ordinators who are faculty members at the schools being tested. We are now at the data gathering stage of an assessment programme that must remain under the public's control if it is to have educational value. The difficulty of maintaining public control of testing information without political misuse cannot be minimised, but we believe in the importance of assessment data in sound educational planning for resource allocation in education.

6. Another important aspect of the State's responsibility in creative school management is programme assessment. The New Jersey Department of Education has direct statutory responsibility for secondary school approval. It is assumed that a trained visiting team can identify indicators of quality during approval visits. It is standard approval procedure in the United States to co-ordinate approval visits with the completion of a self analysis document by the staff of the school to be visited. While this practice has proved itself over the years, its major defect is its unevenness largely due to the great variation in background and training of members of the visitation team. The Department of Education is attempting to develop new instruments, or to utilize those which exist, in order to maximise consistency in evaluating the teaching-learning situation. The

1) Edward L. Thorndike, Educational Psychology, New York, Teachers College, Columbia University, 1924, p. 164.

Department is relying heavily on the techniques of empirical science such as those employed by sociologists and anthropologists in working towards the completion of this task. A study in progress of an urban area serving a minority constituency is being undertaken by a professional staff from the Department utilizing Raths' indicators of a positive teaching-learning situation.(1) During the course of this study, the impressions of the teaching performance of 50 per cent of the district's teachers will be computer analysed to develop a profile of teaching in East Orange, New Jersey. It is hoped that this profile will form the basis for teacher in-service training and recruitment in the future.

Teacher Certification Appeal Procedure

7. While the Commissioner's efforts to innovate have been generally supported by the Governor, the school superintendents and the various professional associations' executive leadership (who marginally reflect the opinions of their membership), these efforts have been systematically rejected and opposed by the leadership of the New Jersey Educational Association, which claims to represent 73,000 teachers as member affiliates of the NEA and is considered to be one of the most militant teacher associations in the United States. The militancy of the professional association is in part a reaction to a challenge by the aggressive policies of the powerful urban oriented American Federation of Teachers, which defeated the association in a major test of strength involving representative elections in Newark, the State's largest city. Teacher union militancy is further aggravated by the demographic situation in the United States in which a declining school age population appears to have less need for an increasing number of trained teachers. Many older teachers feel threatened by the pressure of the young seeking entry into the profession; many first and second year teachers are embittered by board policies, reminiscent of the depression era, that refuse to grant tenure because of the ease with which replacements can be made.

8. Before the job squeeze for teachers reached its present proportions, the Commissioner sought to enlarge the spectrum of talent available to the teaching profession by gaining the State Board of Examiners' approval for the development of an appeal procedure for teacher certification. This procedure permits individuals with unusual skill, experience and aptitude to become fully certified teachers or administrators without completing course requirements. Although this machinery facilitates innovative hiring policies by boards of education, it came too late to provide meaningful assistance during the State's teacher shortage and is presently viewed with suspicion by holders of the standard teaching certificate. It is, however, a possibility that has in fact been used approximately fifty times since its inception in December, 1968, and may be used with greater frequency as schools' programmes reflect the trend toward career education by bringing additional professionals from the "world of work" into the classroom.

Differentiated Staffing Projects

9. The Department's major effort to work with the teacher associations in innovation is a differentiated staffing project which is operating in 60 school districts under Department leadership. This project attempts to determine the results of a school organisation that utilizes master teachers, standard teachers and classroom aides in a task-organised plan designed to allow flexibility and increased individualisation of instruction. Under the "Individually Guided Education/Multi-Unit School" project, such innovations as team

1) Louis E. Raths, Teaching for Learning, Columbus, Ohio, Charles E. Merrill Publishing Co., 1969.

teaching, multi-age grouping, peer instruction, open classroom, inquiry-directed learning and continuous progress learning are carried out by a teaching group in a multi-age, non-graded instructional and research unit. Local teachers' associations have been under increasing pressure from their executive staff to resist the continuation of this project. The State association's leadership characterises differentiated staffing as an attempt to distinguish between teachers and thus weaken their unity. Individual teachers in the State are caught in a dilemma: while they recognise the range of talent, interest and enthusiasm among teachers and would like to maximise the impact of these talented people on the instructional programme of the school, they realise that it is difficult to do this without upsetting the existing salary structure based on length of service and college credits. At present, the differentiated staffing projects in selected school districts have met with the approval of the participating faculty; these projects have yet to undergo the test of negotiation. We are hopeful that in the near future, some teacher-board negotiating process will reflect the elements of differentiated staffing.

Upward Social Mobility and Credit Restructuring

10. This discussion now turns from an emphasis on parents', citizens' and teachers' concerns regarding the educational system to those of its "consumers", the students. One of the major problems in American education is the expectation that the great majority of youth will complete an academic high school programme. The high school curriculum was predicated on the assumption that courses will lead either to college entrance or a technical skill. American colleges have been most accommodating in this regard. With the development of State and community colleges it can be said that there is a college available for any person with moderate intelligence. Skills, however, are a different matter. Saleable skills cannot be bestowed by social fiat; they must be immediately responsive to criteria developed by persons and institutions outside of the educational system. Yet local school districts have great difficulty in gaining positive public reaction to the concept of vocational education. Parents of lower socio-economic status tend to reject vocational training as an attempt on the part of the establishment to prevent their children's upward social mobility. Middle class parents whose children reject college prep courses are dismayed and tend to exert pressure on both the school and their child to conform to their college preparatory expectations. As a result, a large percentage of high school students are spending a great deal of time in general courses which are similar in form if not content to their college prep counterparts.

11. Given America's staggering youth unemployment figures - 19 per cent of youth between ages 17 and 21 are currently unemployed - United States Commissioner of Education Sidney P. Marland has placed a top priority on attacking this problem by urging schools to provide youth with the education and training appropriate to their ambitions. New Jersey's Commissioner of Education has also been trying to influence local decision makers to the importance of career education; in part, by initiating a major restructuring of the State's high school credit system. A serious administrative problem in creating a high school programme responsive to career courses has been a credit structure which has valued college preparatory and general courses over those with more direct skill training. Since the so-called "general course" is patterned on a college preparatory course and is credited equally, enrollment in these courses tends to release the student and the instructor from accountability for specific learning activity.

Depending on the high school population, these general courses do little more than house youngsters whose abilities range from slightly above average in upper socio-economic

districts to illiterates in districts on the lower end of the socio-economic ladder. Students in these courses generally share one common fate: they have been withdrawn from competition on the academic ladder. A small group of youngsters who have made a vocational choice and who are no longer concerned with the trappings of academia are going about the business of acquiring a hard skill which should be marketable upon completion of their high school programme. In America, education's major preoccupation is with upward social mobility; this concept is the yardstick against which most parents judge the adequacy of a school programme. Upward social mobility is viewed by most to be possible only through attendance and graduation from college.. There is impressive evidence to demonstrate that this is no longer true except for a few who have unusual ability and who can profit from the educational opportunities offered by the nation's most prestigious colleges and universities.

12. The credit structure in New Jersey, as in all other States, has been based on the Carnegie unit, which was developed to standardize the crediting of high school course work to simplify the job of college university admissions officers. Invented in 1909 by a college-dominated group, this structure has unwittingly encouraged the proliferation of general courses and tended to discourage students from taking so-called non-homework subjects. Following the recommendation of the Commissioner, the New Jersey Board of Education has passed a rule equalising credit earned with time spent in class, and designed to develop a flexible crediting procedure based on the needs of the individual learner.

This rule has gone into effect from the State's ninth graders (in the first stage of its implementation), and is presently under increasing attack by those who believe in a traditional hierarchy of subject matter. The concept of a hierarchy of subject matter has hampered educational programming since colonial days. Even that paradigm of practicality, Benjamin Franklin, was thwarted in his attempts to develop a people's academy in Philadelphia by the then conventional wisdom regarding the importance of Latin and Greek.(1)

The Guide to Student Rights and Responsibilities

13. Finally, from 1967 until 1970 many of the State's high schools were undergoing serious problems of student unrest. Student disruption presented an unanticipated problem to local school districts; the Commissioner organised the State Department to be responsive to this situation. Department task forces were assigned on a daily basis from one trouble spot to another. County Superintendents of Schools (the Department's field representatives) routinely responded to the distress calls of local administrators and boards. While the Commissioner fully supported the right and duty of boards to maintain order in local high schools, he also sought to understand and alleviate the causes - in addition to treating the symptons - of student disorder.

He further attempted to demonstrate that involvement was more desirable than repression in responding effectively to the climate of fear prevalent in many crisis-torn schools. Thus, in the summer of 1970, in an effort to better understand the concerns of high school youth, the Commissioner involved a group of college students in what amounted to a feasibility study for the creation of an Office of Student Affairs, soon to be realised within this Department. This group of students published a newspaper of low quality, which contained point of view not carefully developed or explicated. The reaction on the part of school administrators and boards of education was immediate and decisive in its criticism of the Commissioner's actions in this matter. Commissioner Marburger accepted that criticism and acted upon it with immediate results, seeking out his critics to determine their major area of concern.

1) John Hardin Best, ed., Benjamin Franklin on Education, New York, Teachers College, Columbia University, 1962, pp. 171 ff.

14. As a result of a series of meetings during 1971 a joint committee of the State's secondary school principals, superintendents and student council leaders, with the technical assistance of the State Department of Education, developed an award-winning booklet "A Guide to Student Rights and Responsibilities." With the endorsement of every major educational organisation in the State, 500,000 copies of this pamphlet were published and distributed to all public secondary schools in the State, as well as to many organisations and community groups throughout New Jersey and the United States. This successful model of involvement of students and leaders of the professional educational establishment in State Department policy-making is further evidence of the Commissioner's creative and sensitive leadership.

CONCLUSION

15. The "Our Schools" project, educational assessment and school improvement programmes, teacher certification appeal procedure, differentiated staffing project, credit restructuring and Office of Student Affairs are examples of the efforts of one State department of education to assist local school systems in solving problems relating to providing good learning experiences to a clientele with changing needs. Each of these is developed as continuing objectives in the realisation of the Department's overall mission:

> "To ensure that each person in the State of New Jersey will be provided the opportunity to achieve his full educational potential in accordance with his own unique abilities, goals and aspirations."

This mission statement, with its accompanying continuing objectives, should be understood as in part responsive to the Department's legislative mandate, but also as an expression, in the management terms of creative educational planning, of the Department's creative spirit and direction.

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ABSTRACT

This publication is one in a series of case studies dealing with educational innovation in various western European countries and the United States. This particular report discusses educational innovation in Sweden. The author attempts to describe the basic structure and character of the Swedish educational system, in addition to examining specific educational innovations and strategies for reform. In his analysis, the author concentrates primarily on describing, rather than criticizing or commending, the Swedish situation. The appendix contains a descriptive table listing school research projects underway in Sweden during the 1968-69 school year. (JG)

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INNOVATION IN EDUCATION

- SWEDEN -

by

Stuart Maclure, Editor of The Times
Educational Supplement, London, England.
The report is based on a visit to Sweden
by Mr. Maclure and Mr. Krste Crvenkovski,
Presednik Saveza Komunista Makedonise,
Centralni Komitet Saveza Komunista
Makedonise, in April, 1969.

TABLE OF CONTENTS

PREFACE

The following case study is one in a series of five dealing with innovation in education. All the studies are descriptive in nature and, as the work of five different authors writing in their personal capacity, they represent five quite individual syntheses and interpretations of vast amounts of information. Yet the confusion that might be expected from this method does not result. What emerges from these studies is instead a reasonably coherent statement of educational responses to the post-war demands of many more people for more and better education.

Perhaps it is not remarkable that the demands have been exerted so consistently on such a variety of nations, nor that the response to them has for the most part been so quick and positive. The nations examined in this book are remarkably similar in that all have a long and honourable tradition of public education, an industrialised economy and a high standard of living. At first glance it even appears that their solutions to the problem posed by recent educational demands are unusually similar: structural reform, curricular reform, compensatory and/or individualised learning systems - examples of each are easy to find in any setting. Yet a closer reading of the five case studies reveals wide and interesting variations: in priorities, in perceived solutions, in strategies evolved or developed to implement them.

Such variety of course reflects to a large extent differences in 'national climate', that peculiar combination of values, objectives, aims and administrative tradition which, aside from language, makes a nation distinctive. The explication of these differences is thus a hidden theme of the five case studies taken as a whole, and an understanding of this hidden theme is necessary to illuminate the more obvious themes of change and growth.

An explanation of this point can be found by comparing, even superficially, Scandinavian countries such as Norway and Sweden on the one hand and the United States of America on the other. At least from the viewpoint of the outside observer, Norway and Sweden have much in common. Both relatively small in terms of population, they can also claim a remarkably unified social and value structure. Furthermore, their style - if such a generalisation can be made - seems to be to have a clear idea of goals and then to set about methodically reaching them. This process is aided by the existence of strong central governments which are able to plan and to legislate with a reasonably clear assurance that what they propose will be achieved. Thus there exists in Norway the National Council for Innovation in Education whose mandate it is to make reality of reform laws passed by the central Parliament. The Parliament, concerned in recent years with "large questions of the role of schools in Society", and sure enough of its constituency, has concerned itself largely with structural reform and new curricula - on a national scale.

The situation in the United States is quite different, even if the question of relative size of total population is ignored. The American federal government is based on a system of checks and balances so fine that it is often hard to determine either the source of impetus or its ultimate manifestation. The situation is further complicated by the well-protected existence of states' rights - particularly the control of education - and, once the issue of taxation is raised, by municipal and regional claims as well. Perhaps more important, the rich diversity of the American population inevitably means conflicting social and ethnic interests, values, and views of national priorities. The past decade of American life has indeed been one of fast-changing goals and objectives and of massive social upheaval. Much of the upheaval has connected itself to education and made demands accordingly: in the light of this political and social back-ground, it is not surprising that American education responded by producing such a variety of innovations in every area and at every level that the final array can be quite bewildering, whilst at the same time providing a vast reservoir of experience for others.

England and the Federal Republic of Germany likewise provide differences quite distinctly their own. Writing of her own country's approach to recent educational change, the author of the English case study notes.

> ".....the English style is distinctive. You can seize on it instantly. There is no acceptance of common objectives, except in the most general sense which inspired the last major education act: the need to widen opportunities and eliminate the poverty both of individual children and of the public provision of education. There is no national plan for education, no law which specifies where development is necessary as in some OECD countries. There is almost no theory. The point is characteristically made in a recent major report on education : 'we invited the help of a number of distinguished educationists and professors of educational philosophy ... They all confirmed the view that general statements of aims were of limited value and that a pragmatic approach to education was likely to be more fruitful.'"

The reference to "two decades of non-reform" in German education, a phrase coined by Professor S.B. Robinsohn, is slowly becoming eroded, especially during the last two years, which have been marked by fundamental changes in many parts of the school system. With increasing co-operation between the Länder and with the initiatives of the new Ministry for Education and Science, the need for a more systematic approach to educational reform, and especially to educational experimentation, seems more important in Germany today than in many other countries.

Despite these differences in background and style, the five country studies do show one overriding problem in common: the need to change and improve their educational systems. Furthermore, as their experience increases, they all face the reality that explicit measures to facilitate the management of educational change are necessary, that innovation and improvement cannot be haphazardly left to chance.

A NOTE ON THE SWEDISH ADMINISTRATIVE SYSTEM

For the sake of clarity elsewhere in this report it is necessary to include a brief note on the Swedish administrative system as it applies to education and educational innovation.

Swedish Ministries are, by international standards, small. They are the secretariats for the Ministers, concerned with the political and economic policies for which the Ministers are answerable to Parliament. They are concerned with policy planning on a short and long term basis.

Much of the work which would fall to a Ministry in most European countries is done by independent boards - in the case of education, the National Board of Education (responsible for schools) and the Office of the Chancellor of the Universities (responsible for higher education). These independent boards administer the law of education.

Local administration is in the hands of the elected local municipalities who number more than 900(1)-(for a population of 7.8 million)-and most of which are very small.

National policy is to give more power to the local authorities and to reduce their number. The curriculum is firmly controlled from the centre, though an increasing discretion is being given to local authorities over optional areas of the curriculum. The costs of education are divided as to 60 per cent from the State and 40 per cent from the municipality. Teacher's salaries are tied to state grants.

In addition to the municipalities, powers are delegated to county education boards which are decentralised organs of the central government.

Also of great importance are ad hoc Royal Commissions set up from time to time to prepare recommendations on major aspects of policy. In some cases these Commissions include strong political representation as in the case of the 1946 Commission which formulated the proposals laying down the main lines of comprehensive reform. In others, though the public interest is always clearly represented, experts may be more to the fore.

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(1) The number of education authorities was reduced to 464 by amalgamation of districts in 1971.

PART I

EDUCATIONAL INNOVATION IN SWEDEN: INTRODUCTION

Sweden's strategy of change in education is coherent and self-conscious. It is articulated to a degree which is unusual among OECD countries. It is based on the formulation of objectives at every stage and level, and the application of consistent planning procedures to achieve those objectives.

The strategy is now being adapted to the concept of 'rolling reform', by which is understood a continual process of evaluation and renewal. The aim is to make innovation a permanent state in which curriculum and organisation are under constant review in the quest for better responses to changing circumstances, new knowledge, more effective learning and better use of resources.

Before going on to describe the strategy in greater detail and to indicate some of the directions in which innovation in Swedish education is pointing, it is necessary first to discuss some of the background factors. These include the political basis of Swedish educational reform, the strongly centralised nature of Swedish educational administration, and the characteristics of the Swedish teaching profession.

Political Commitment

At the centre of the strategy is a clear political commitment. This needs to be stated at the outset. The Swedish approach to educational reform can only be understood in the light of a solid political consensus. All the main political parties now accept the objectives of the comprehensive school which are, in effect, the objectives of Swedish education. This is not to say that there is no controversy, nor that earlier decisions were easy to reach. But what stands out as abundantly clear is that the reform has its origin in bold decisions taken on political and social grounds and that the commitment to social equality and mass education which these decisions entailed has now become part of the Swedish way of life - no longer a matter of acrimonious debate, but rather part of the political climate.

The reforms emanate from a Royal Commission set up in 1946. During the second world war there had been lengthy debates on the future of Swedish education. The system at that time was divided. The education of most of the children was limited to the elementary school. Only a small proportion were taken out of the elementary school for selective secondary education. Commissions of experts had produced a succession of reports in which there were conflicting proposals. The 1946 Commission, in which the politicians were strongly represented, cut through the pedagogic controversies and demanded a policy squarely based on social and political premises. In effect, they asserted that education was too important to be left to the educational experts. Instead of allowing pedagogic considerations to determine educational organisation, the Commission insisted that the

educational system, a potent agent of social control, should be subordinated to basic social policies, and in particular to ideals of social equality and co-operation on the one hand, and the development of individual talent on the other.

Here, in the jargon used by American curriculum experts, was the unambiguous assertion of 'societal' interests from the outset. Just as this has remained dominant in discussion of the aims of the education system as a whole, so too has it applied to the application of reforms at every level. The Royal Commission technique has been applied to the comprehensive school (with the Comprehensive School Committee of 1957) and the gymnasium (the Gymnasium Committee) and to subsequent investigation of the fackskola (continuation school) and entry to higher education. All these commissions operated under directives which interpreted the main over-riding policy objectives.

This is something which has to be borne in mind in connection with the research and investigation carried out for these commissions, as the OECD report on Educational Policy and Planning in Sweden (1967) made clear. The interplay between the politicians and social scientists has amounted to a dialogue inside and outside the several Royal Commissions. Much of the dialogue is inconclusive: policy in the end has had to be based on judgement, aided but not determined, by research. Professor Husen's comment, quoted in the OECD document, already referred to, is still to the point: the research findings' 'first and foremost importance lay in the fact that they have contributed to removing a host of prejudices and showing that what was involved in the debate were value judgements rather than facts. The school reform is, after all, a political question'.

It seems important to stress this from the start, especially as there could conceivably be a temptation as 'rolling reform' relies on techniques of Research and Development, to expect too much of the research function. The objectives are based on political conviction, not research. If - to take an extreme case - political will demands as an objective that water should flow uphill it would be imprudent to expect research to provide conclusive evidence on which to base such a policy.

The political will which lies behind Swedish educational policy has to be seen against the background of the Swedish political system in which the present governing party has occupied a leading role since the early 1930's. It is this long-term stability of political control which has made possible the ordered educational reform and the careful preparation which has preceded each stage of its application. It has also provided the healing element of time by which much of the heat can be removed from the bitterest controversy. And this same political stability, which has facilitated long term educational reform itself, possibly stems from a social homogeneity and common purpose in a close knit community of less than 8 million people, which makes the direction of the reform generally popular.

Central Administration

If the clarity with which social and political goals have been articulated is the first key to an understanding of Swedish educational reform, the second concerns the system of educational administration.

Swedish education is tightly controlled and directed by the central government, through the Ministry of Education and its twin administrative agencies, the National Board of Education and the Office of the Chancellor of the Universities.

School reform and innovation is, therefore, directed from the centre. The initiative is handed down through Parliament to the National Board of Education, which in turn must organise change and create the circumstances in which innovation takes place. The strong central control extends not only to matters of organisation and of 'quantitative' planning but also to the 'qualitative' planning of the school curriculum. The syllabus and study plan for each type of school is the direct responsibility of the central government. Commissions set up to carry through major changes in organisation have been expected to plan the whole programme of studies as well as the administrative changes which a new system of organisation might entail.

It so happens that a part of the reform is intended to introduce a greater degree of decentralisation. Before the introduction of a comprehensive system, the elementary schools and the vocational schools were run by the local municipal authorities, while the secondary schools were State schools administered by the central government. The policy is to increase the powers of the local authorities - which now have been given responsibilities for the comprehensive schools and the secondary schools - without forfeiting the even standards of school provision which are claimed to be the consequence of centralisation.

In addition to the local authorities there is also a layer of 'decentralised central government' based on the 24 administrative county units whose general functions include the appointment of teachers for the 9 year comprehensive school and in-service training. These county boards of education are further responsible for the planning and co-ordination of education in the different municipalities.(1)

It can be seen that, with some 900 local authorities in a population of less than 8 million, many of the local bodies are very small indeed, their chief officers being local head teachers. At the other extreme is the local authority for the City of Stockholm with a population of 800,000 and a director of education supported by a strong professional staff.

While, therefore, the policy of decentralisation has already begun to have some effect - and some of the large authorities are, themselves, centres of innovation - the fact remains that the Swedish strategy is firmly founded on a strong central authority directing, and if necessary imposing change at the will of Parliament. If the word 'impose' carries extreme overtones, all that is intended is to clarify the source and the authority for innovation which is undoubtedly located in the agencies of the central government.

It is this centralisation which has ensured that from the outset matters of internal school management such as streaming and differentiation have been considered alongside larger questions of organisation. Similarly, responsibility at the centre for the

(1) The number of education authorities was reduced to 464 by amalgamation of districts in 1971.

planning of the curriculum means responsibility also for teaching methods. Where, in some systems, these matters might have been left to the discretion of local authorities or to the teachers themselves, Swedish centralism requires that they be considered as a whole and at the centre.

It would be wrong, in stressing this aspect of Swedish educational administration, to imply an authoritarianism which does not exist. But there is no doubt about where authority lies, nor yet is there any reason to doubt that this is an important (and possibly a somewhat corrosive) element in the relations between teachers and administrators. It also forces the innovators to employ fairly rigid techniques where they might prefer to act in a more flexible way.

The Teaching Profession

Any strategy for innovation within an educational system must take account of the teachers who already staff the schools. Here Sweden is in the remarkably fortunate position of having a good supply of well qualified teachers, enjoying high prestige and relatively high salaries in a community which recognises the value of education.

The educational system has rapidly moved out of a situation in which there were too few teachers into one in which there is now something like a balance between supply and demand. Class sizes in the comprehensive schools assume not more than 30 children to a class except for the first year (the seven-year olds) where the maximum permitted number is 25. The teacher pupil ratio is, of course, much more favourable than this - about 1:15 in the comprehensive schools and 1:13 in the secondary schools.

The class teachers - those teaching in the first six grades of the comprehensive schools (ages 7 to 13) - receive a two and a half or three year training at colleges of education. Subject specialists for the upper forms of the comprehensive schools and the secondary schools have a university degree followed by a year's teacher training. A second degree is normally required for senior posts in the upper secondary schools. The differences in the education and training of teachers are reflected in their professional associations, their salary scales and to a large extent in their attitude towards the educational reform.

The combined effect of a strong political will and a strong central administration may have contributed somewhat to the alienation of certain sections of the teaching profession, particularly 'subject specialists' in the upper forms of the comprehensive schools and the gymnasia. On the other hand, new organisation, new curriculum and new methods have been pressed upon them from above, some of which have demanded changes in their conditions of service as well as their pedagogic technique. Moreover, the very nature of the political basis of the reform has meant that any groups who opposed aspects of the change - for whatever reason - have tended to be branded as conservative, if not reactionary. None of this is surprising - if the educational reform is indeed part of a social revolution, a certain amount of ideological pressure is to be expected. But it certainly increases the importance of in-service training (of which more later) and, it could be that it does little to sharpen the self-critical

faculties of those who are most committed to the reforms, and who have been chosen for that reason to carry them out.

This could all become of greater importance as the Swedish system moves forward from the heroic period of radical reform, when major steps forward were initiated by Royal Commission leading to legislation, into a period of 'rolling reform' in which the pressure for innovation is expected to come from within the educational system.

It will be seen, then, that each of these three aspects of the Swedish educational scene - the political commitment, the centralised administration and the large and highly qualified teaching profession - contributes positively and negatively to the process of innovation. The political foundation is essential: yet the very strength of political will necessary to carry out long term reform can set up its own orthodoxy which may not always be conducive to innovation. The centralised administration provides an efficient instrument for organising change. But so far this has been a means of introducing innovation from on top, with the limitations which this implies in respect of the professional self-confidence and inspiration of the teachers. The highly qualified teaching profession makes possible high standards and ambitious policies which would not be open to a system with overlarge classes and undertrained staff. But this, too, can be a limitation on innovation: if radical change is needed which alters the whole role of the teacher, the presence of a powerful cadre of traditionally minded professional men and women is not going to be an unmixed blessing.

PART II

INNOVATION STRATEGY

The basic strategy of Swedish educational innovation assumes

1. Clear political decisions on the goals of the educational system and the objectives to be achieved in each type of school. These major political decisions have, on the whole, been taken on the advice of Royal Commissions on the basis of which the Minister of Education formulates legislation for Parliament.

2. The refinement of these general goals and objectives into a working curriculum and study plan for each type of school.

3. A programme of in-service training for teachers to assist the introduction of new curricula and teaching methods.

4. A programme of Research and Development to support the policies of reform and innovation.

5. A system of continual revision by which the curriculum and study plan for each type of school is constantly assessed in terms of its own objectives.

Aims and Objectives

According to the Swedish Schools Act of 1962, the general aim of the schools system is 'to impart knowledge to the pupils and train their ability and also, in collaboration with the homes, to promote the development of the pupils to become harmonious persons and active citizens aware of their responsibilities'.

These broad aims apply particularly to the comprehensive schools or compulsory schools taking pupils from the age of 7 to 16 through the first nine years of schooling. But they also apply to the secondary schools and are taken as the point of departure for the Syllabus and Study Plan manual (Läroplan) for the new gymnasium.

This general expression of the individual and social aims of the educational system has been expanded and made more specific by the policies and statements of Ministers and educational leaders. As Swedish techniques of innovation are directly linked to the establishment of objectives and the systematic planning needed to achieve them, it may be helpful to summarise the five main objectives of the Swedish educational system, as set out in the OECD publication entitled Educational Policy and Planning in Sweden (1967).

Objective 1. This relates to equal opportunity for public education without regard to income, social origin, sex or place of residence. It also recognises that while opportunity should be universal, individual talents differ, and that the aim of the school system should be to meet the differentiated needs of various groups

of students. No one branch of education, however, 'should in itself be considered more worthy of esteem than another, the entire school system constituting a co-ordinated whole'.

Objective 2. This concerns the function of the school system to safeguard and strengthen the democratic system which depends on co-operation and tolerence. From this are derived certain sub-goals, a common core of learning in the comprehensive schools and the post-ponement of differentiation; group work and discussion methods; civic education; education which stimulates critical thinking.

Objective 3. The third set of objectives are directed towards general economic development - the preparation and training of skills in the light of national manpower needs. But this is subordinate to the individual and social objectives summed up in the first two objectives above.

Objective 4. This commits the educational sy[illegible] flexible in order to respond to changing social, individual and economic needs. From this, it follows that education must be broad enough to allow for new vocational needs which may develop and require individuals to change their occupation later on in life, and that premature specialisation and dead-end courses must be discouraged.

Objective 5. This has to do with the effective use of the educational system's limited human and material resources, by a commitment to 'rationalisation' and the pursuit of the most efficient way of using teachers and arranging learning systems.

An important part of the Swedish method of innovation has been based on the refinement of general aims of the educational system into specific objectives for teachers in schools. The setting of clear objectives has been used both as a means of changing the practice of the teachers, and also to provide criteria against which to evaluate the success of the innovatory process.

In this the Läroplan for each type of school plays an important part. This document, running to 500 closely printed pages, which has no counterpart in less centralised schools systems, lays down the syllabus, and study plan for the type of school in question. In addition to setting out the content of the courses to be covered and the number of hours to be devoted to each subject, it includes a long introductory section explaining and elaborating the objectives of the school and the recommended methods of instruction and internal organisation which are related to these objectives. Here is part of the Introduction: Goals and Principles to the Läroplan for the new gymnasium which came into operation in 1966.

"1. Comprehensive Schools - Gymnasium

"1.1. The purpose of the education of children and young people, provided by society, is to communicate knowledge and develop skills and, in collaboration with the home, encourage the development of the pupils into harmonious people and able, responsible members of society.

"This is the substance of the first paragraph of the new Education Act. It refers to all instruction provided by society

to children and young people, whether voluntary or compulsory. Thus it is valid for the gymnasium as well as for the comprehensive school.

"In the gymnasium, as in the comprehensive school, the work of the school will be focused on the individual pupil. The aim of the work of the school is to promote the all-round development of each pupil, to encourage the development of his personality and to make him a free, independent and harmonious being. The training which the school provides must be <u>individual</u> training. ..

individual is ... a fellow-creature and a citizen. He is a member of a family and of a circle of friends and acquaintances, and he is a member of society. ... Therefore the gymnasium, like the comprehensive school, must give social training. The social training provided by the school must lay the basis of, and develop, those qualities which will, in a period of rapid development, enable the pupils to support and strengthen the democratic principles of tolerance, co-operation and equality of sexes, nations and people. One of the principal aims of the social training which the school provides is to instil into the pupils respect for truth and justice, for the human dignity of all people, for inviolability of human life and thereby for the right to personal integrity. ...

"2. <u>Tasks of the Gymnasium</u>

"In the work of the gymnasium special attention should be given to the folowing:

"2.1. The instruction provided by the gymnasium is based on the nine-year comprehensive school. It must provide a foundation for further study at university level and other post-gymnasium education, and for immediate entry into the labour market.

"One principal element of the instruction provided by the gymnasium is to develop an <u>independent</u> and <u>critical</u> attitude. The result may vary within wide limits, but from the very beginning the pupils should become accustomed to an inquiring attitude towards the knowledge and information offered them inside and outside the school, to check the correctness of information, the structure of arguments and the reliability of conclusion, and to make strict demands on intellectual honesty in their evaluations of others' information and in expressing their own views. ...

"A pupil should always be allowed, after independent consideration, to accept or reject a judgement. This implies that the demand for objectivity should be made a general rule for all instruction. ...

"In modern society <u>understanding of, interest in, and willingness to involve oneself in, other people's problems</u> are necessary complements to knowledge. Insight into human and civic situations is important for all those who, in their work, have to act as leaders, or co-operate in otherways with people, and influence other people's conditions. Work at school, as in the

"fields of science, administration and economic life, is based upon continuous co-operation between people. Collaboration in social, occupational, political and other groups demands the will to understand and to co-operate, even when opinions differ. Work at international level involves that people judge others on the basis of their own traditions, history and social life.

"By paying attention in its work to the personal development of the pupils, the gymnasium also satisfies the demand for social training. Such training, no more than individual development, cannot be separated from other activities in the gymnasium. Social training is intimately bound up with the whole work of the school. Different methods of work, such as group work or individual study, satisfy this demand just as well as do school and environmental practice, or special preparation for future tasks.

"2.2. An important task of the gymnasium is to develop further what the comprehensive school has taught the pupil in terms of general ability to communicate with others. A central task in this is to develop his linguistic skill. The ability to express oneself clearly and logically in one's own language, to formulate one's thoughts both verbally and in writing, must be developed. If it trains a great number of its citizens in the use of foreign languages, Sweden will be able to maintain and widen the contacts which further its cultural, technical, economic and social expansion. Skill in foreign languages is therefore necessary. ...

"Mathematics is one of the means of communication which have become increasingly important. Quantitative methods have gained ground also in studies in which formerly these methods were not employed. They have also gained a footing in economic life and in administration; this is especially true of statistics, which have become a valuable tool in making predictions, analyses of costs and work, and so on.

"The aim of the gymnasium, therefore, must be, over and above the foundation laid by the compulsory school, to develop the mathematical skills of the students.

"2.3. In order to satisfy the demand for preparation for future education, or occupation, the gymnasium must provide the special preparation which the individual may want and need. It is impossible, however, to allow each student to realise his interests. The personal aspirations and the demands of labour market and society must be brought into balance. To determine this balance, however, is not the task of the gymnasium. Therefore, there must be, in the curriculum and organisation of the school, possibilities of taking into account personal talents and interests, and of letting them guide the pupil towards a more or less individualised programme of studies. But even if divergences are allowed within the common framework, the result must not be that the individual pupils' study programmes differ too much from the demands made by the branch in which they will be working after school.

"In particular in the economic and technical streams, the special preparation the gymnasium offers must be planned carefully in view of the tasks the students will be confronted with in their working life. By its instruction, the gymnasium must offer students a preparation for the labour market, for many of them will, at the end of their gymnasium studies, go direct to economic life and administration.

"2.4. Society demands - besides certain special preparation and skills in communication - general knowledge and skills common to all or most people, a frame of reference in which important phenomena in society and culture can be placed, and which will facilitate contacts with and understanding of one's own and of other peoples's culture."

The Läroplan then goes on to discuss common core. The emphasis is strongly sociological. Social and economic geography and civics are needed to encourage a proper understanding of Scandinavia and other countries and peoples in Europe and in "the so-called under-developed countries with which relations are more and more intensified." With this goes an understanding of comparative religion and cultural differences. All also are required to have an introduction to science and technology, to history and art. Other aspects of the programme singled out for special mention include teaching about careers and education beyond the school stage and physical education. There follow comments on how pupils should be taught to carry out their work.

"2.5. It is one of the tasks of all types of school to develop the pupils' working habits. When they leave school, the pupils should be able to perform tasks which require a sense of responsibility, whether in their work or in connection with further education. For the gymnasium this means that its pupils, when they leave school, shall be accustomed to taking the initiative in planning and performing large tasks, independently or in co-operation with others. This includes the ability to collect the necessary information, to interpret and evaluate it, to plan their own work, and finally to assemble and report the results. The gymnasium must further develop the training in techniques and skills of studying and carrying out tasks with which a beginning was made in the comprehensive school. This implies also that the methods of studying in the gymnasium must be such that they help to develop the students' ability to make observations and to take the initiative, as well as to make independent judgements."

This general Introduction is then followed by a second section on 'General Principles' which describes in greater detail how the earlier-stated objectives may be reached in school organisation and instruction.

Among other things, it spells out ways of promoting co-operation between home and school; discusses the methods of consulting pupils through the school's 'students' advisory council'; draws attention to the importance of educational and vocational guidance; lays down principles for the options leading to higher education or employment. There is a lengthy section on teaching' which indicates the manner in which the teachers should prepare their courses and teaching materials.

Another section sets out to show how, by group work arranged in various ways, the curriculum can be made, in the official view, to contribute to the general aim of co-operation between pupils. Yet another concerns the objective of independent study, study training and guidance in study technique, on which great importance is placed. Marking is discussed at some length in view of a decision to end the formal student examination at the end of the gymnasium and to introduce a system of assessment over the whole gymnasium course designed to enable teachers to mark fairly from one end of the country to the other without recourse to external examinations except as a moderating technique.

The justification for quoting at this length from the Introduction of the Läroplan is the significance which the Swedish theory of innovation attaches to the statement of clear objectives. This is at the heart of the system. There is, of course, room for debate as to how clear the statement of objectives really is. Some of the objectives, inevitably, are in conflict with one another - or rather, a state of tension exists in which a series of not wholly compatible aims have to be held together in a working compromise. A statement of goals does not relieve the planners or the practitioners of the need to have priorities. All the objectives become priorities but some are higher in rank order than others, and to be a low priority comes to mean the same as being no priority at all.

Nevertheless, whether or not the statement of objectives is, or is not quite as sure a guide to action as, in theory, it should be, it serves its purpose because it is accepted at face value. It becomes a potent weapon in the hands of the planner, a blunt instrument with which to concentrate attention on the application of agreed policy.

The official position is that the Läroplan is only guidance for the teachers, prepared by the National Board of Education, which experienced practitioners in the schools may take and apply at their discretion. The study plan and syllabus, including the way in which the weekly hours of work are to be divided, is centrally determined (though local authorities are being given more marginal discretion). These have to be followed. But much of the scheme is written in general terms or provides options which allow the teacher considerable latitude and room for manoeuvre. And, although on matters of method and approach, the Läroplan represents the collective wisdom of practical teachers, inspectors and advisers, the teacher in the classroom is technically free to prefer his own methods, provided they are directed towards the overall goals of the plan.

The impression which a visitor to Sweden is likely to gain is that the National Board of Education may be tempted somewhat to overstate the importance and influence of this document which the teachers are at pains (for reasons of professional autonomy) to understate.

These differences of emphasis may not be unimportant in a consideration of techniques of innovation as great weight has been attached within the National Board of Education to the process of regular revision of the Läroplan.

Methods of Revision

This is organised within the National Board of Education in the department of general education (UA) where there are working groups and committees concerned with curriculum in each type of school. As soon as a new curriculum is brought into operation it is the task of the relevant group to set about the evaluation of the working of the curriculum in the light of the stated goals and to prepare proposals for revision.

These revisions have tended up to now to have been undertaken in conjunction with changes in organisation following the operations of a Royal Commission. The decision to introduce the new upper secondary school in 1971 in which the gymnasium, facksola and vocational schools are to be brought together, has necessitated a full scale revision of the curriculum.

Techniques by which the working groups within the National Board of Education have carried out the revision have varied, according to different types of school and different sections of the curriculum. One method has been to investigate the existing practice by the use of mixed reference groups - teachers, representatives of employers and employees and universities, inspectors, administrators, and often students themselves - and for the officials of the National Board of Education to move forward in the light of the recommendations of these bodies. According to circumstances varying weight might be attached to the subjective judgements of teachers and others, and to the more objective methods devised by social scientists in University and other research institutes.

Curriculum building has been undertaken within the National Board of Education, taking into account the availability of teaching materials on one hand and of the training and retraining of teachers on the other. The stages, however organised, have been, first, the investigation of how the schools are working - how closely they are following the study plan and how successfully they are working towards the stated objectives. This has meant evaluating not only the work of the teachers but also the study plan itself. To a pragmatic observer there appears to be a heavy reliance on the statement of abstract principle and the confident assertion on a priori grounds that particular practices in school will contribute (or ought to contribute) to the fulfilment of these abstract principles. Part of the work on the revision of the study plan must be to test whether the a priori reasoning has been borne out in practice.

Having evaluated the present practice, on the basis of reports from school inspectors and reference groups of teachers and teacher-consultants, the working group has then had to take into account any changes in demand - from the employers, trade unions, universities and from the pupils themselves, and any conclusions these consumers of education may have reached about the working of the existing curriculum.

New curricula have then been proposed which, without altering the objectives, have been judged to contribute more effectively to their achievement. This has been where the general suggestions have had to be translated into a study plan which could in turn be passed on to the teachers in the schools, and used as the basis for in-service training.

It is clear that there have been many differences in the way the actual curriculum building has been done in the past - in the amount of detailed planning which has been undertaken and in the extent of the field-testing which has been included. Different methods have been found to be appropriate for different types of schools and even for different subjects within the curriculum as can be seen, for instance in the revision of trade courses at the vocational school.

Training and Retraining of Teachers

Swedish educational innovators have clearly recognised the critical importance of training and retraining in any strategy of innovation. Spending by the National Board of Education under this heading rose from 1.14 million Sw. Kr. ($230,000) in 1960 to 31.62 million Sw. Kr. ($6.3 million) in 1969. Some 260 teacher-consultants are in service, working half-time as teachers and half-time as curriculum advisers with other teachers. It is estimated (1969) that some 10,000 teachers will take part in courses, most of them lasting a week but some extending to two or three weeks. In addition to the expenditure from central funds the local authorities spend about 10 million Sw. Kr. ($2 million) on local in-service training schemes.

During recent years there has been an attempt to promote more short courses and local teachers' study circles where specific curriculum questions can be studied with the aid of teaching materials specially prepared for the purpose.

In the Autumn of 1969, a major programme of re-training began in connection with the new curriculum to be introduced into the comprehensive schools in 1970. All head teachers in the country were to attend four-day courses, arranged on a regional basis. Similar study conferences were planned for the spring of 1970 for all teachers in the comprehensive schools - 55,000 of them. Teachers in the upper forms would attend for four days; those working in the lower three forms will only attend the first two days.

The new 1970 curriculum for the comprehensive school involved the extension of modern mathematics teaching and the introduction of English at the third grade. Both of these changes have involved special training for the teachers who have had to equip themselves for new tasks. Radio, television and correspondence courses are being used for this purpose. Altogether, the National Board of Education allocates about 2 million Sw. Kr. ($400,000) to the planning and production of study material for in-service training. It will be seen that, even leaving aside the special programme for the introduction of a new comprehensive school curriculum, the scale of the in-service training effort is considerable, with about one teacher in 10 attending summer courses of from one to three weeks and an estimated 80,000 teachers taking part in up to five obligatory study days each

year when the schools can be closed while the teachers work.

In-service training and retraining is held to be important for two separate reasons: first, as a means of introducing particular changes in organisation, curriculum and method; and second, as a means of building up the professional self-confidence and commitment of the teachers.

The inertia of the teaching profession is one of the restraints which any concerted attempt to promote innovation must tackle. This is true in Sweden as elsewhere. It is ironical, perhaps, that in Sweden, where the comprehensive principle has most wholeheartedly been adopted, the teachers are themselves fairly sharply divided by type of training, school function, salary scale and professional association. The teachers' unions belong to different trade union groups, which adds to the divisions.

The Swedish authorities have recognised that the introduction of new methods make heavy demands on the teachers. Even with the volume of in-service training which is now undertaken there are complaints from the teachers that not enough is being done to train them in the use of new materials and methods and that the changes they have to face are not being taken into account. Often these changes are subtle, affecting the teaching craft itself, the teacher's feeling of security in his mastery of the craft and the satisfaction which he derives from his work. A part of the training and retraining programme has to be directed at eliminating the fears of teachers on these grounds and building up their confidence and competence in handling new techniques.

Much of the training programme concerns the individualisation of instruction - a concept which any visitor to Sweden soon encounters (and to which reference is made later). Individualisation is one of the primary objectives of the system. ('the work of the school will be focused on the individual pupil ...'). What makes it a matter of day to day concern, however, is the determination to postpone differentiation, streaming and selection to the latest possible stage, and to keep as much of the curriculum as possible common to all pupils throughout the compulsory school from 7 to 16. Even if the centrality of the individual were not stressed as clearly as it is in the stated objectives the practical tasks of teaching in an unstreamed group might be expected to place this in a prominent position. Unless the teachers can be shown effective methods of individualising instruction for a teaching group of 25-30 children of widely differing ability, those who have been accustomed formerly to teaching selected groups are likely to be frustrated by what seems to them the reduced effectiveness of formal class teaching and the consequently lower satisfaction which they will derive from the job.

Some of the pressure for retraining has come from complaints of this kind. Teachers who have not discovered how to provide individually for their ablest and least able pupils within the same teaching group, have encountered discipline problems. The theoretical answer to this has been to advocate a more active and interesting classroom and school environment in which disciplinary difficulties would disappear when all children were individually at full stretch. Hence the emphasis on group methods and on teaching aids, and, above all, on such individualised instructional systems as are becoming available.

The most important and advanced of the individualised instructional systems now coming into use - IMU mathematics - is described in a later section of this report. From the teachers' point of view the question which is likely to arise is whether there is any conflict between the co-operative goals of the school and the pedagogic necessity to individualise instruction. As yet this remains an academic question, though one of which teachers and administrators alike are well aware. The more extensively the curriculum were to be individualised, the more acutely this could bear upon the schools.

Rolling Reform

As already mentioned, Swedish educational administrators believe that the educational system should now move forward into a new phase of development in which curriculum reform should be a permanent, self-renewing condition. On this reasoning, innovation becomes a state of mind and an administrative attitude, not something more or less traumatic which requires a Royal Commission to carry it through.

Royal Commissions, of course, will continue to be used where appropriate. One of the features of the systematic approach to change which the Swedes have adopted has been that reform has been co-ordinated and efforts have been made to ensure that the separate parts of the system are prepared for the consequences of changes in any one part. A Commission is still likely to prove useful where structural changes are needed. Among Commissions now working in the educational field is a major inquiry into the organisation of post-secondary education which is studying the changes which will be required in the light of the explosion of numbers in secondary education and the consequential pressure on higher education. When it is said, therefore, that rolling reform will replace the more formal techniques of the Royal Commission, this mainly concerns matters of curriculum and methods.

Two main reasons are given for the need for 'rolling reform'. The first is that society and human knowledge are changing so fast that any system which remains static soons becomes out of date. The second is that the educational system must constantly seek to innovate in order to rationalise: it must always be under the same pressure as any other large scale enterprise so as to be able to use its human and material resources to the best possible advantage.

A policy of rolling reform means seeking ways of systematising the present processes of revision, relying less on the estimates of teachers and others, and more on the social scientists. Plans are already in hand now(1) for the revision and evaluation of the new gymnasium curriculum. This is known as the LAG project. Some of the thinking behind rolling curriculum reform is set out in a paper on 'Principles for the further revision of the Swedish gymnasium and and continuation school curricula' dated 28th June, 1968. This is specifically concerned with the secondary schools' curriculum. The techniques under discussion, however, apply to curriculum renewal generally.

Rolling reform does not mean allowing reform to take place on the initiative of the teachers themselves. "The fact that the Board of Education will in the future play a primary role in the school planning /in contrast to ad hoc Commissions/ should not mean that questions of

(1) Summer 1969.

method are to be attacked solely by teacher-steered reforms. On the contrary, we should strive to develop planning methods with a view to covering the relevant problems more completely and achieving an improved optimal technique in step with development in the social sciences. ...

> "A self-evident aspect of revision is that of rationalisation. Every change must be a gain and the results must be reflected in more efficient teaching.
>
> "The principles laid down for this 'rolling reform' ... should provide a pliable instrument for the continuous renewal of a system previously characterised by a high degree of inertia ...
>
> "We must try quickly to obtain an overall picture of how the new system is functioning in relation to the educational aims established with the decision of Parliament in 1964. The object here is to locate the greatest faults and establish where the greatest difficulties are encountered. This, if possible, should be done in such terms as permit the ranking of different problems in priority order. The 'problem sectors' involved can be of various kinds: specific systems of materials or methods, new text books and other materials, more concrete recommendations, administrative measures in respect of joint classes and other forms of grouping, questions relating to in-service training and teaching qualifications, alterations to the time-table and, of course, changes in the actual aims of teaching. If the target set proves to have been too ambitious then it must be lowered; if it is achieved with a wide margin, then we must either alter the target or reduce the time allotted.
>
> "The object must be to illustrate the situation of different subjects as thoroughly and objectively as possible: this can be achieved partly by objective tests of the students' knowledge, but it is at least as important to try to attack the problem in the actual teaching process, e.g. by surveys among teachers and students with other methods. We are, as yet, at too early a stage in the discussion to say whether this should be by interviews, questionnaires, the critical incident method, or similar. ... Such studies could now be of great use, before any less desirable teaching methods and material become firmly established, and before teachers and students can accuse the Board of Education of coming too late. As regards the technical design, it should be possible in the initial stages at least, and under certain conditions, to make use of gymnasium inspectors and consultants in the collection of information. However, it is very important that the work of reform be clarified from the beginning in collaboration with the institution or institutions that are to participate by performing studies."

Central to this approach to curriculum renewal is a close study of the internal function of the school and the teaching process itself. Here, 'the emphasis must be on these important variables, namely: time, principal subject matter, and method'.

> The paper continues: "For internal function analysis to give reliable results, it is necessary that general planning models be scientifically evolved for teaching in different subjects. It is

"important also to construct easily used tools to measure, for instance, student attitudes to teaching in different subjects. It is of particular importance to be able to chart how the new forms of work introduced in the gymnasium and continuation school function in practice. To obtain the relevant data for a future analysis of the internal function of the curricula, more consistent planning and application of the curricula will be necessary. This will take the form of local studies at specific schools. ...

"The object is to let each school handle the investigation of a particular line or sub-alternative. ... It is also intended that the working groups at these schools should structure the content of certain subject curricula, so that a study schedule can then be built up in which such aspects as co-ordination, methods and aids are considered in more detail. In this way, the aims of the curriculum can be 'tuned' to the right level.

"The results of such activities will then be presented as a basis for further analyses of the internal function of curricula.

"It is important that the Board of Education penetrate from the very beginning the different functions of the project, and give it a general design that will cater satisfactorily for the demand for topicality, by developing methods of work that make continuous allowances for the requirements of recipients, and of society at large. Experience of planning during the last year suggests an increasing emphasis on the development of new methods in work on the curriculum. ...

"The intention is primarily to evolve certain routine procedures in the different functions of curricula work, to meet the requirements for periodicity. Even if the Board of Education, through its gymnasium inspectors and school consultants, has the means to follow the introductory phase of the new gymnasium and continuation school in some detail, it would be unreasonable to see this as the only instrument for a thorough analysis of all phases and tendencies during the introductory period. And to base future changes solely on the experience of the Board's officers would be to underestimate the actual renewal taking place among teachers 'out in the field'. More methodical analysis, and a better way of channelling the flow of information, is very necessary. We can say quite generally that the demand for rapid changes in the curriculum will increase, owing largely to the increasing mobility of the labour market, and this alone necessitates and warrants a real effort to make work on the curricula pliable. ...

"The demand for 'currency' can be met also by the Board of Education, in accordance with the directive of the Minister, keeping in contact with various reference groups, such as the associations in different subjects, trade organisations etc. To maintain continuous contact with such reference groups is an essential aspect of work on the curricula.

"To meet the requirements of recipients and society at large within the framework of the project, it is necessary to continue with the methods of study applied on a limited scale by the

Gymnasium Commission. It is possible, for instance, within the Board of Education, with the help of the gymnasium inspectors and other officers, to make quick, practical inquiries in order to chart the problems that arise, and also to make larger-scale studies among employers, e.g. in respect of how continuation school students are adjusting to the labour market. ... In this way, the requirements of subsequent employers can influence the design of curricula more directly. .

"A principle in planning the project has been that those engaged in the different parts of it shall devote themselves mainly only to their particular sector.

"In planning the project, it was thus considered unsuitable that those engaged in, say, analysis, should at the same time be called on to assess the proposals presented for a new curriculum. The different ingredients of the project break down into what we can call an analysis function, a construction function, and field tests. Other important aspects include consultation with research."

The author goes on to discuss how, when the process of analysis has been completed the actual work of curriculum construction begins. The approach which he outlines is that developed at the University of Gothenburg by Dr. Urban Dahloff and Dr. Erik Wallin in connection with their studies in educational technology.

"On the basis of the material emerging in analysis, the leading curriculum shall give such directives that temporarily engaged experts are able fairly easily, and above all quickly, to produce proposals for a new curriculum in their subject. Secondly, on the basis of what the experts produce, the constructors are to provide a foundation for any experimental activities ... which will then be evaluated by the constructors, and furnish the basis for a final decision on changes in the curriculum. ...

"Changes in the requirements of recipients, and of society at large, will also be channelled through the construction group. With their capacity for goal-analysis ... this group will be able, in the reconstruction of curricula, to exploit innovations suggested not only by life in the schools but also by more general considerations of educational policy. ...

"Owing to the great effort made on the analysis side of the project, the space devoted to field tests has been reduced. The term 'experimental activities' has consciously been dropped in this context. It is intended that the trials held in the future within the project will really be 'field tests' of a given proposal. Such a proposal will in a way already have been tested, in so far as it is the result of very careful analysis, after which it will have been goal-analysed and evaluated by experts in educational technology. For this reason it is intended only to make isolated field tests, and the costs of this should be relatively low."

Not only does this approach rest on models formulated at Gothenburg, it is also being carried out in close co-operation with the university's Institute of Education.(1) Several members of the staff of the National Board of Education who are invclved in the LAG project have joined the Gothenburg course in educational technology which has been set up with support from the Board's Research and Development Funds. These include Mr. Cervall, who leads the project.

As will be seen from the diagram showing the system model of educational technology developed in connection with the Gothenburg course (see p. 30) the approach is sophisticated and theoretical, with great emphasis on goal analysis. It covers both the general planning of educational systems and the planning of instruction - in other words it looks at both large-scale and small-scale questions. "Instruction might be defined as goal-directed and systematic modification of behaviour." The goals, principals and dimensions of education, obtained as a product of community planning, must be broken down step by step to be transferred by way of instruction to desired changes in the behaviour of the members of society.

> "Not least the development in programmed and so-called pre-produced instruction has given rise to radically changed views on such questions as defining objectives, steering and controlling the quality of instruction. The whole of this process, from the analyses made by the educational planner on the macro level to the construction of the shortest instructional sequence must be well synchronised. We have chosen to call that part of education concerned with the application and development of methods to effectuate this development process 'Educational Technology'. It should already be clear that this field of work has become so comprehensive that a differentiation of the functions can be discerned. The first phases of this process seem to coincide well with the concept of Educational Planning, while the others correspond most closely to what we mean when we speak of Instructional Planning and Instructional Technology.
>
> "The boundary between Educational Planning and the Instructional Planning is often diffused, as these terms are applied to parts of the same process.
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> "It was on this background that the Institute of Education deemed it urgent to start a university course in Educational Technology. This new course satisfies a great need which is obviously present and also prepares the way for a more comprehensive and systematic view of problems of education and instruction, as hinted above. For several reasons, Educational Planning has been given less scope than Instructional Technology. The course is intended for the growing group of people who, in various ways, are engaged in or will become engaged in one way or another in planning, construction, administration and evaluation of education and training in the public educational system and in the commercial

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(1) As it happens, however, the theoretical work by Dr. Dahlhoff on which the working model is based was not financed by the National Board but by funds from the National Bank's Jubilee Fund.

"and industrial sector, as well as in national and local government, different forms of adult education and so on.(1)"

The course is mainly for educational administrators, curriculum experts and industrial training officers and to fit in with their employment it has been arranged in eight units each lasting a week. The intervals between these units are devoted to reading and practical work on the systems in which they are currently employed. The practical work is regarded as of great importance.

Another Gothenburg project - COMPASS (Comparative Analyses of Objectives and Processes in School Systems) - is playing an important part in the LAG exercise. In order to assess the extent to which existing courses fulfil the aims which the curriculum has been given, Dr. Dahlhoff is carrying out an investigation in the Gothenburg Secondary schools. His great concern is with the actual process of teaching which in his view has been often overlooked in discussions of organisation, intelligence and so on. He has shown, for instance, that general statements about streaming or non-streaming are unlikely to be meaningful unless the actual teaching process is considered in detail as well as the overall organisation.

In the COMPASS project, five subjects in grade 2 of the gymnasium are being closely examined. Four times a year information is collected from the pupils and the staff to establish

1. What the classes are dealing with at the time of inquiry.
2. By what methods.
3. What they have been doing since the beginning of the term.
4. What problems they have come up with.

The inquiry goes on to cover teachers' plans for the next period, pupils' attitudes towards methods, subjects, teachers and their school work in general, and the pupils' marks and results in standardised tests. (See Chart p. 36)

Research and Development

It will be seen that the method of curriculum reform outlined in the LAG paper relies heavily on research and development and on the assistance of experts in the social sciences from the universities and teachers' colleges.

It takes a resolutely optimistic view of the extent to which curriculum planning can be placed on a scientific basis. In the confidence it reposes in the social scientists it reflects the efforts made throughout the planning of the Swedish school reforms to build research into the programme at every stage. Most of the Royal

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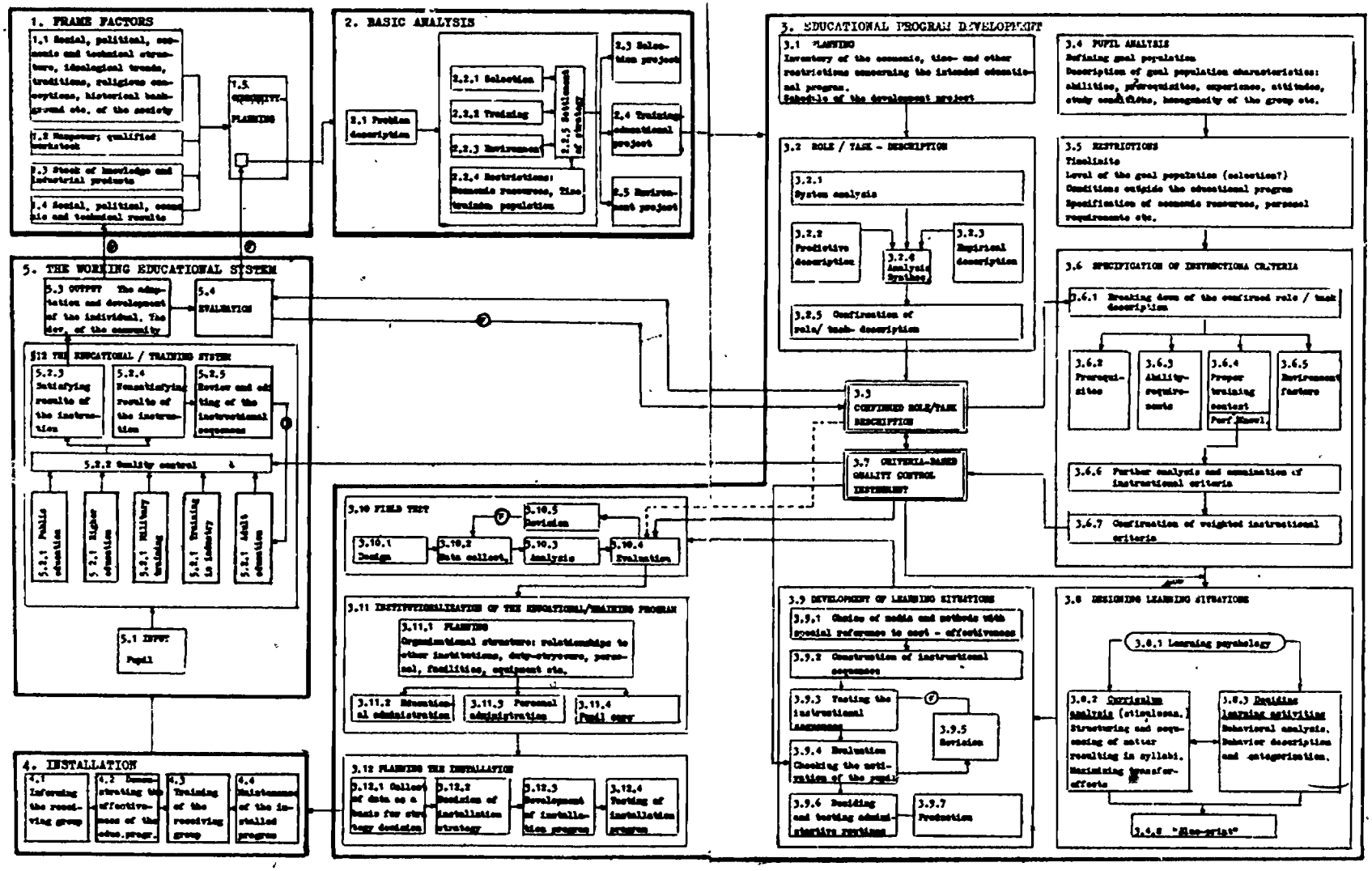
(1) From School Research Newsletter - 1968: 1, Planning and construction of a university course in Educational Technology, National Board of Education, Stockholm, Sweden.

A SYSTEM MODEL OF EDUCATIONAL TECHNOLOGY



Bo Eriksson, Department of Education, University of Göteborg, Sweden

Commissions, which planned the different phases of the reform of the educational system, incorporated programmes of educational and social research. Swedish politicians and administrators have gone further than their counterparts in most other countries to form close links between the research workers and the decision-makers.

In 1962 a new bureau - known as L4 - was formed in the National Board of Education to plan and supervise educational research and development. 'R and D' funds allocated through L4 now amount to about 10 million Sw. Kr. ($2 million) a year, having risen steeply within the last few years from an original figure of about 2 million Sw. Kr. ($400,000).

L4 is a small unit led (at the time of writing: 1969) by Nils-Eric Svensson and Eskil Bjorklund. It does not undertake any direct research itself. Instead, it plans the distribution of NBE research and development funds mainly to universities and research institutes. As these funds represent the overwhelming preponderance of the money available for educational research and development, its influence is obvious.

According to Professor Harry Passow of Teachers' College, Columbia University, who recently carried out a survey of Swedish educational research activities and the part played by Bureau L4, (1968), the Bureau "appears to have a web of close relationships with the various research institutes wherein the research and development work is actually undertaken, with the functioning bureaux and offices of the National Board of Education, with the Ministry and its Commissions, with practitioners in the field, with publishers and materials producers, and with other research founding agencies such as the Social Science Research Council. When direct access to the Director General of the NBE is added and when one considers that basically Bureau L4 is two individuals, the growth of this bureau's influence becomes even more significant. Quite clearly, Bureau L4 is not in business to distribute mimeographed research reports, rather, it views its mission as contributing directly to the determination of educational policy and to decision-making.(1)"

There are two ways in which projects are chosen for support. In many cases the initiative comes from the university or the research institutes. L4 is likely to back a promisiong project which offers itself. The network of informal relationships is such that the Bureau is likely to be able to keep well informed about up-and-coming people and ideas worth supporting. Many of the likely project leaders are themselves in consultation with other branches of the National Board of Education and there is a free flow of information about on-going curriculum reform and innovation which keeps the research workers in touch with thinking inside the National Board.

In other cases, the Bureau will 'solicit' proposals when it has a clear demand for a particular kind of work to be undertaken in connection with some work within the Board. It is obvious that there

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(1) Bureau L4 and Educational Research and Planning in Sweden. A. Harry Passow, NBE School Research Newsletter, 1968:9.

It is obvious that there will be many occasions when a project takes shape by a combination of these two methods.

To assist in weighing up the projects which are put forward, the Bureau has the assistance of an advisory Committee and a Consulting Committee, the latter body consisting of the heads of the various research institutes plus a number of influential co-opted members, being the more important in determining policy. According to Professor Passow,

> "Since all of the research and development is actually undertaken at the research institutes, the heads are directly involved in the preparation of the budget, in the determination of which problem areas will be tackled, and to a certain extent, where projects will be placed. True, this is done in an advisory capacity but it does represent a relationship between the Bureau L4 and its project-operating institutes which is quite unique. In the context of the Swedish system, this appears to be a positive relationship and may help short circuit the delay in developing, funding and implementing proposals."

L4 has the responsibility for providing a policy framework within which the National Board can support research and development, strong enough to yield the positive advantages of coherence and co-operation, yet not so intrusive as to impose any kind of stultifying uniformity. It has, as it were, to orchestrate the themes which emerge from the independent activities of original minds in the universities and institutes, in harmony with those which come out of the practical activities of the National Board. While it is clearly not possible to draw a hard and fast line between pure and applied research in education, the general assumption is that to be eligible for support from L4, a project should be directed towards solving questions fairly directly related to the needs of the schools.

In addition to the support of work at universities and research institutes, money is also channelled into less obvious social science-based development projects such as those already undertaken by the National Board of Education in connection with curriculum reform. These include the new 'development groups' set up by a few local authorities, among them Malmö (see p. 38). So far this local activity is on a very small scale but may be expected to grow considerably if the early experiments prove successful.

Systems Approach

As more funds have become available since 1964 the policy of NBE has been to concentrate research and development efforts on the process of instruction and in particular to develop a systems approach to curriculum development. This has meant giving support to projects using a Methods-Materials-Systems approach. Much of this work bears on the individualisation of instruction which is seen as one of the central problems in the development of mass education at the primary and secondary stages.

It is the National Board of Education's expressed intent to "improve the school by systematising and instrumentalising the instructional approach." It aims at designing "prototypes for

"instructional systems and at the same time to develop, in so far as possible, models for more and more production-oriented research and development."

In a memorandum on the development plans for 1968-69, the National Board of Education wrote at some length about the direction of the development work which it was intended to support and shows how heavily committed it is to the instructional systems approach.

The memorandum stated(1): "Naturally, the steps taken to reform our schools depend largely on the views we hold about what is actually meant by instruction. The traditional view - which is now beginning to be questioned - implies that the main role of the teacher is to transmit information. Concepts like class and lesson are fundamental for our present instruction model. The task of the teacher is conceived as to organise the pupils' learning mainly by giving lessons (class instruction).

> "In Sweden the teacher's work is usually defined as equivalent to a certain number of lessons including preparations (teaching duties). One of the disadvantages of this way of measuring a teacher's work is that it may easily give the impression that the most important thing is to give lessons, that the task is to communicate a certain - both informative and character training - message and that, if this is done conscientiously, it cannot be helped if some pupils fail to acquire knowledge or learn skills as well as might be wished.
>
> "The unit, the building block, according to this traditional instruction model, is the lesson, a period of instruction led by a teacher. The class-and-teacher thinking, however, leads to difficult, laborious forms of work; the teacher has a rule always to take the whole class or group into consideration. The demand for the individualisation of instruction within the framework of the class will usually be difficult to satisfy. This model does not pay sufficient attention to the fact that the fundamental point in instruction must be the learning activities of the individual pupils.
>
> "The class and lesson model means that the planning of instruction is largely the responsibility of each individual teacher. Each class works during each lesson according to the plans made for that lesson by the teacher of the class. For most teachers and pupils this can hardly give the desired quality and the desired differentiation. The class and lesson as a planning unit must therefore be regarded as being both too large and too small. The planning of instruction should be directed to the activities of the individual pupils. In order to make this possible it is necessary to make use of more resources than are available with the class as a planning unit. The planning must therefore be done in a wider frame of reference than the class.
>
> "What will an alternative instruction model look like? Experience of research and development ... suggests the following, perhaps slightly exaggerated, comparison between two instruction models.

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(1) Educational Research and Development in Sweden. Plans for 1968-69. NBE School Research Newsletter, 1967:2.

Instruction Models

Aspect	Present Model	Alternative Model
Planning unit	Class; lesson	Pupil, groups of pupils; larger sections of courses
Integration, systematization, planning	Mainly by the individual teacher; often not best combinations of media; often great qualitative differences	Largely already at the construction stage; systematically tested combinations of media; effects of use predictable
Construction of instructional material	Usually only textbook; without systematic production and testing	Instruction systems; systematic construction and testing
Teacher function	Primarily information communicator	Primarily tutor, "stimulator", work leader
Personnel structure	One teacher per class/group and lesson, with sole responsibility	Teams of teachers, e.g. with senior masters, teachers, assistants, etc.
Realization of changes	Often slow, with uncertain effect	May, in principle, be more rapid and certain
Individualization	Usually little	May be made as comprehensive as desired
Pupil activity	Often little (except for homework)	Great (study work in school)
Learning effect	Varying, difficult to measure	Each pupil's progress may be followed continuously

"In the opinion of the NBE, one of the principal aims of the educational reform work is to develop and test the alternative model of instruction. This model is expressed here in general terms. It is, of course, much easier said than done to change school instruction in the way that is outlined here. If - or more correctly, perhaps, to what extent - this can be realised, depends, naturally, on how far we are prepared to devote our resources to endeavours in this direction.

"On principle it is possible to construct instructional systems of the type outlined here for a school subject or group of subjects or for a certain part thereof and for a number of annual courses or parts of such courses. In such a case the content and forms of work are defined and ordered to make a well-planned system. Strict programming, in the accepted sense of the term, of pupil activities cannot be considered except in very limited sectors, e.g. training skills. The system must be flexible and aim in the first place at creating methods by which pupils can work independently, alone and in groups alternatively. The scope for group work, discussion, lectures, laboratory work, demonstrations and other 'social' situations, etc., is made within the given framework as large as is considered necessary in each individual case. The work of construction is extensive: the purpose is to arrive at a system in which the work of pupils, teachers and other personnel, and the utilisation of material resources of different kinds (media combinations) best serve the various functions of instruction (e.g. motivation, planning, presentation, directing attention, problem solving, feed-back and evaluation).

"The task of the teacher will be mainly that of a tutor, 'stimulator', and, to a certain extent, the governing, responsible administrator. The communication of information will be by way of the different learning arrangements included in the instructional system. In principle this will allow for a large measure of individualisation, and it will thereby create scope for a strengthening of the relation between the teacher and the individual pupil, the teacher will have more opportunity of devoting himself to the most important educational tasks.

"Here instruction is planned to a great extent partly in the constructional stage, with a large number of interchangeable alternatives for different sections of a course, and partly in the different schools (in collaboration with senior masters, teachers, assistants and the pupils themselves).

"Since central parts of the courses will be tried in an experimental way so that their learning value can be determined, it may be possible to guarantee that certain goals, considered essential in the curriculum, can be attained by all pupils. ..."

The memorandum goes on to describe the stages in a project involving the development of teaching materials summarised in a simple flow chart:

Plan-ning	Pre-tests	Ana-lysis	Con-struc-tion	Field test-ing	Prod-uction	Train-ing	Use

"The fundamental point in a systems approach", the memorandum concludes, "is that all links in the chain of production are developed within the framework of the same project.

"The main thing is to create direct and easily accessible communication lines between the goal definitions of the curricula and the various media combinations and teacher contributions which facilitate the pupils' learning activities. All links in the chain must fit into each other, and stand up to the demands made: if a pupil does not learn what is required of him, it is the fault of the system, not of the pupil."

As already indicated, most of the research sponsored by the Board of Education through Bureau L4 is carried out at the research institutes in the Universities and teachers Colleges.

A short-list of projects now in hand is appended at the back of this report to give some impression of the range and character of the programme. The examples to which reference is made in this report are taken from Gothenburg and Malmö but these are, of course, only a small part of the total research effort.

Individualisation

The individualisation of instruction is the recurring theme. "One gains the impression that those projects which deal with the basic problems of individualising and differentiating instruction - whether in terms of diagnosing and analysing those differences or developing materials and methods for meeting them - are at the heart of the planning needed to realise the school reforms which have been promulgated over the last few years.(1)"

The outstanding example of this approach - quoted to a visitor wherever he goes - is the IMU Mathematics project at the School of Education, Malmö. The project was begun in 1963 and the materials are now being field-tested on a large number of schools.

So far the main emphasis has been on producing material for grades 7 to 9 in the comprehensive school (ages 13-16), but preliminary studies have also been carried out with younger and older children.

The decision to develop materials for this purpose originated in the National Board of Education shortly after evidence was received of work on programmed learning for mathematics in the United States in the early 1960s.

The project has four aims:

1. to draw up and test self-instructional teaching materials in mathematics,

2. to test suitable teaching methods for the use of the material,

3. to discover in what way the students should be grouped and the teachers used in order to obtain the maximum effect from the material and the method,

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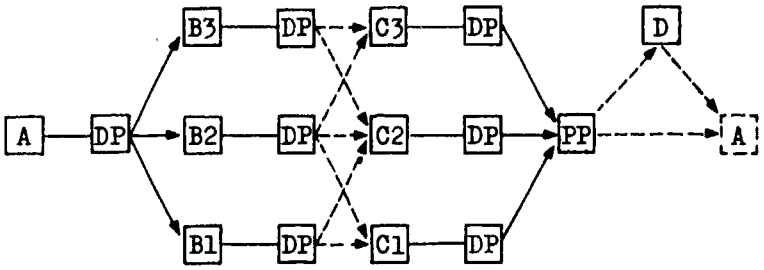
(1) Passow: op cit.

4. with the aid of the constructed material to measure the effects of entirely individualised instruction.

The project, in fact, combines three different types of innovation. First of all, it demands a review of the mathematics syllabus and the revision of the content in line with 'modern mathematics'. Second, it demands individualisation - the opportunity for pupils to work on their own, at their own pace. And third, it demands a new approach to the use of physical and human resources, new ways of using staff, flexible class sizes, and a new attitude on the part of teachers.

The material for the three school years of grades 7 to 9 is divided into nine sections known as modules. Each module provides work for a third of a school year, in the form of six to eight components - work-books of from 50 to 150 pages each. Each module, however, is provided at three levels of difficulty so that a pupil can move at the speed and degree of complexity suited to his ability.

The student is piloted through the course by a series of diagnostic tests taken after each component. Thus all take component A at the start of the course, which lasts three or four weeks. They then take a diagnostic test, on the basis of which they go on to component B at the appropriate level (B1, B2 or B3), and so on through the module. Switching from one level to another is quite frequent and the units of work are arranged in such a way as to facilitate this.



Sketch illustrating the principle of a module. DP = diagnostic test. PP = prognostic test. A in the frame on the extreme right marks the beginning of the next module.

The components each last about a month which means that the teachers have about 10 occasions a year to help students choose the right level of work for the next stage. "In this way and also because students are relegated at intervals to 'zero level' the difficulty level of the material to the students' actual performance and thereby reduce the risks of students being assigned once and for all to a particular level. Component D contains material for 'individual work', that is to say, more independent tasks. The better students choose one or more such tasks themselves and receive material and suggestions for the tasks which they will plan and carry out by themselves.

Reports on the tasks take place individually or in the form of a little 'tutorial' for those students who have chosen the same task.(1)"

The scheme offers, in effect, about 10 million permutations and combinations in the attempt to satisfy individual needs.

An unusual feature of the plan is a pamphlet for parents to help them understand what is happening and to introduce them to the new mathematics which their children are studying.

The material has now been under test since 1966 when the first version was tried out in a school with a small test group of 75 students. On the basis of this, the work-books were revised: all exercises with a 'solution frequency' of less than 80 per cent were changed or rejected. (This reflects the strong PL influence). Testing of the second version began in 1967 with a larger test group of 300 students.

The third version is now being tested in some 300 classes: 11,500 students are taking part, of whom some 2,000 are being investigated closely.

A visitor to a Malmö school where the material is being used would find these classes - 80-90 children - may be supervised by two teachers and one auxiliary (unqualified). (Other combinations of classes may be taken by other combinations of teachers and auxiliaries). A teaching group of 90 will be seated in a school dining hall or assembly hall. Each child will have his own assignment, periodically seeking assistance from one of the adults present. Some will be doing a revision exercise using small tape-recorders and earphones. Others will be doing diagnostic tests. A few will be sitting doing nothing, looking rather bored.

The team teaching approach and the big class organisation has been adopted for a number of reasons:

- students' work must be frequently checked and tested
- teachers have to keep careful notes on the progress of individual students
- there is a lot of material to cope with
- this means a lot of routine clerical work for which an unqualified assistant is eminently suitable
- "the majority of the teachers and some of the students considered that the students' motivation could be further stimulated if individual tasks could be replaced from time to time by group activities".

The organisation of staff and students in this pattern leads to financial savings. It is estimated that the money saved by the use

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(1) Some Facts About IMU, Hastad, Svensson and Oreberg, Department of Educational and Psychological Research, School of Education, Malmö, 1968.

of unqualified auxiliaries is sufficient to cover the extra costs of the expensive work-books - the cost of materials is about $20 a head, a year - and also making a real saving. This reflects partly the high level of teachers' salaries in Sweden and the differential between the teachers's pay and that of the assistant. The following description of how a typical lesson is prepared and conducted is from Some Facts About IMU by Hastad, Svensson and Oreberg.

"1. The lesson is prepared during a conference held by the teaching team to determine which tests will be held, what group instruction will take place, who is to be responsible for the group instruction, which material is to be distributed to which students, etc. The assistant takes notes throughout the conference.

"2. The group instruction, if any, is prepared by the teacher nominated.

"3. Before the lesson commences, the assistant produces all the material required.

"4. During the lesson the assistant is busy distributing and collecting material, supervising students carrying out diagnostic tests or solving problems, noting the students' progress through the course, the extent of their homework, checking their attendance and so on. The assistant should be sufficiently familiar with the material so as to be able to answer simple questions posed by the students. In general, however, she will refer the student to one of the teachers. Meanwhile, the teachers circulate among the students, helping those who have got stuck, seeing to it that the students work carefully and in accordance with the instructions laid down, giving the students encouragement and spurring them on, discussing the results of diagnostic tests, helping the students to choose suitable sections for revision, etc. One of the teachers may be busy on group instruction.

"5. After the lesson the assistant arranges all the material.

"6. Before the next conference the assistant corrects the students' diagnostic tests and enters up all the data on the students' progress, etc. The scope of the assistant's work is normally subject to local circumstances, but the following tasks are probably her most important ones.

" - To attend the lessons

" - To be responsible for the material

to ensure that the material is stored neatly so that it can be clearly surveyed

to select the material required before the lessons

to maintain a complete stock by making the necessary orders for replacement

" - To register the current work of the students

" the students' progress in their studies (once a week)

the students' homework (once a week)

results of the diagnostic tests

results of prognostic tests

booklets currently used by the students

" - To register student data

previous marks

test results

contacts with parents or guardians

" - To correct diagnostic tests

" - To copy out and make stencils of material produced by the teachers for group instruction

" - Clerical duties of various kinds, including keeping the minutes at conferences, notes on group instruction, notes on absence.

"7. At the next conference (a minimum of 1 conference per week per big class is necessary) the teaching team discuss their experiences, go through the results of the diagnostic tests, decide on measures to be taken following the results, for example individual revision or group instructions, survey the students' progress in their studies, decide whether any students require further encouragement, help, etc. The following questions are dealt with at the majority of conferences:

" - How far have the students progressed with their work? How much homework have they been doing? Do any students need special homework?

" - How have the diagnostic tests turned out? Which students need to revise their work?

" - Ought there to be group instruction next time? What type of group instruction? Who is to organise it?

" - Are there any students who have nearly completed their booklets? Which booklets should we recommend for their next phase?"

In addition to the IMU project there are others using similar techniques being carried out in the teaching of English and German.

No one who talks with Swedish officials about innovation can doubt that great store is set by these schemes. Although the IMU project has been carefully researched, it is too soon to evaluate it fully. Those most directly concerned with it tend to be more cautious in what they claim than the central administration, which seems at times to have

decided already that necessity demands that it shall live up to the hopes placed upon it.

It seems that this project, like others relying on programmed instruction through a single medium - and in this case, the printed page - makes considerable demands on the students' powers of perseverance. The pupils' interest is strongly stimulated at the outset. The curve rises, then it begins to fall. There is no doubt that it is daunting for a visitor to enter a classroom at 8.15 a.m. to be told that the 90 children sitting at their desks working at their assignments with more or less enthusiasm were starting a self-instructional lesson which would last for one hour and 40 minutes. It would become still more daunting if the rest of the curriculum were being similarly individualised.

This raised one of the minor conflicts between objectives which must arise quite frequently. The long, double period was the logical outcome of a policy laid down by the National Board of Education to improve the pupils' study technique and powers of independent work. Chopping the curriculum up into short periods, with time wasted in between is held to militate against sustained and purposeful study. But long periods of unbroken study may in themselves conflict with the aims of individualisation, if it proves difficult to sustain motivation for individual study on IMU lines for so long a period on end. It may be that the a priori reasoning in favour of longer periods of study is being challenged in this respect by experiment.

As to individualisation as such, it seems the IMU project has started from the premise that the work should be made as fully independent of the teacher as possible - the statement of aims uses the phrase 'entirely individualised instruction'. It must strike some observers as another paradox, that this attempt to go the whole distance in the direction of self-instruction should take place in a school system which is particularly well endowed with well qualified teachers. The explanation is not wholly economic, though the rational use of resources is recognised as of great importance. It is more likely to stem from the theoretical basis of the Methods-Materials-Systems approach which aims to make learning depend as little as possible on the intervention of the class teacher and as much as possible on the design of the 'super-teachers' responsible for the system as a whole.

It could be that this assumption is coming to be questioned, as experience challenges the attractive but essentially naïve belief that there can be a 'best' method of teaching which can be universalised through a 'best' set of structured, individualised teaching materials.

The interesting point of development may be the way in which the more active participation of the teachers is combined with the use of the new instructional materials - not only by general tutorial activity but from time to time in more orthodox forms of group teaching and activity.

The IMU project - as the prototype of the more ambitious attempts at individualisation - again underlines the need for the retraining of teachers. As the earlier quotation from Bjorklund and Svensson made clear (pp. 35-38) this goes to the heart of the matter. Individualisation presents a frontal challenge to the traditional role of the teacher.

"Good instruction has up to now been considered to be synonymous with good teachers. The teaching function rather than the learning function has been considered to be the essential factor in education. In the present development in this respect the emphasis is shifting towards an increased interest in the pupils learning activities. Accordingly, it becomes more and more accepted that the teaching ability is to be measured not by what the teacher does but by what happens to the student and how he ultimately performs. In addition, the requirement today is that the instruction should be individualised so that each pupil is given optimal possibilities for advancement in his school work from his own current level of knowledge and ability to higher levels. A general application of the ordinary class instruction conducted by the teacher from his desk is obviously neither efficient nor rational.(1)"

When asked about this - the size of the revolution in thinking which is demanded - Swedish administrators will point to the big programme of in-service training now undertaken (see p. 22) but concede that as yet the majority of teachers are unaware of the magnitude of the changes demanded. Some who have faced the challenge have responded to it with enthusiasm. Others have faced it and withdrawn to cultivate their traditional skills. But for the most part, even in Sweden, where the level of concern is high and the direction of advance is clear, it is still not difficult for most teachers to remain oblivious of what researchers mean when they talk about Methods-Materials-System.

If an unduly wide gap exists between the innovators and the practitioners, the limitations this must impose are obvious enough. According to some research workers it is also hindering research and development. Some teachers have become reluctant to answer questionnaires and supply information needed for research projects.

It is in this connection, perhaps, that work at the local level - teacher-led development which clearly has a low place in the hierarchy of innovation in Sweden - may come into its own.

Local Development Groups

One way in which the innovators have sought to spread the message of 'rolling reform' has been by setting up a small number of local development groups, based on some of the more progressive local authorities. Since 1964, Malmö has been one of these local authorities. Under the leadership of Mr. Lars Kjellman, the director of education, and his staff, the city has established a series of projects which include team teaching, the integration of social studies, experimental methods of study training and the use of other new teaching methods and teaching aids.

Valuable knowledge and experience is being gained about the practical applications of new ideas such as team teaching. A visitor to a Malmö comprehensive school may find these classes together in a lecture room watching a film strip and listening to a tape on a topic on current affairs. From this the classes will move to their own rooms with individual or group assignments. These will require them to use

(1) E. Bjorklund, Educational Innovation in Sweden, 1966.

the school library and resources centre, collecting stencilled working papers and, if necessary, drawing on further material on tape and film strip. At a later stage the groups will be reassembled to collate their separate activities and share their experiences.

The development work is focused on the main objectives laid down for the schools and is aimed at making a reality of the educational reform. Much of it is closely related to the retraining of teachers but because it is locally directed and teacher-led, it has certain advantages over other forms of in-service training. Having started in only a few schools, the scheme in Malmö has now been extended to all the city schools, in close co-operation with the Malmö School of Education.

Some 20 educational advisers are working in the Malmö comprehensive schools, spending part of their time as teachers and part as consultants for particular subjects or stages of education. The development groups are financed jointly by the municipality and the National Board of Education. It is beginning to be recognised that there will soon need to be a revision of the financial relationship between central and local government because the present central government grants, being directly linked to teachers' salaries, discourage local authorities from exploring more rational uses of resources.

One of the practical functions of the Development Group is to highlight technical restraints of this kind.

An incidental advantage of the local authority development group is that pedagogic experimentation may also lead to more adventurous administration in other respects - as for instance in the design of school buildings which both permit and encourage progressive teaching methods. This has been the experience at Malmö where new school building is reflecting new teaching methods, and in addition, is obtaining better value for money.

At this grass roots level there is a certain amount of reserve about the impact of 'innovation from on top' - the local administrators noticeably identify with the teachers rather than with the social scientists who inspire the central administration. There is a clear understanding that if you attempt to go too fast with innovation the process is self-defeating. This can be interpreted as a certain diffidence about the presentation of fully developed systems. Malmö is one of the places where IMU is being tried out, not without quiet resistance from conservative-minded teachers. At the local level there is far more likely to be an understanding that teachers need to be made to feel that they themselves are part of the innovatory process - "we must try all the time", someone observed, "to make the teachers feel this is something they are doing for themselves, not something coming from on top".

It is also in the localities that teachers and local authorities can talk and listen to each other - an essential element in radical innovation if teachers are to be convinced that new methods do not threaten their professionalism. It is not a question of rejecting systematised teaching materials, but it does suggest a preference for curriculum material which can serve, as someone put it, as bricks for the teacher to build with rather than a whole prefabricated structure.

PART III

CONCLUSION

Innovation in Swedish education is being organised with a skill and systematic efficiency which cannot fail to impress visitors from less highly organised communities. Any conclusions which are reached are therefore less in the form of criticisms or commendations than part of an attempt to identify some aspects of the Swedish educational scene which raise wider questions for others interested in the organisation of change in the educational system.

Objectives

This must be the starting point for any concluding discussion. The Swedish system relies heavily on the analysis of objectives. At successive stages from the education acts down to the detailed curriculum the relevant objectives are set down and policy is based on them. Within the technique of innovation itself there is a determination to use the methods of management by objectives. In everyday conversation with teachers, administrators and research workers it is common to hear people acknowledge that the setting of objectives is a political or quasi-political responsibility, separate from the executive functions of administration and teaching. In fact, the idea that the community can, through its political institutions, lay down the educational objectives and leave their interpretation to the school system, has been firmly and successfully instilled into the world of Swedish education.

The question which the outside observer must ask is whether reality altogether corresponds with this ideal.

It is fairly clear that in a society which has multiple aims, the aims of education are also bound to be varied, and, in all probability, conflicting. This seems to be illustrated in Sweden by the attempt to dedicate education to two separate objectives - the co-operative ideals of a society which would like to be more egalitarian, and the aims of individual development and self-fulfilment.

To point this out is not to indulge in sophistry or to play with words. It is to question whether the objectives are stated as clearly as they are conventionally believed to be. The directions in which they point, though not identical, are seldom diametrically opposed. What this means is that the way the objectives are interpreted is all-important, and to suppose otherwise would be to take an over-simple view.

Moreover, if it is acknowledged that in a plural society, there will always be inherent limitations on the extent to which clear objectives can be analysed and adopted, then it suggests that Swedish experience in this respect is more important for the myth which has been built - successfully - around it, than as an example of how to divide public and professional interests in educational innovation.

Of course, this makes it no less functional in the Swedish setting, though it suggests that sooner or later the incompatibility between individual and corporate objectives will have to be faced. At the present the assumption is that these can be reconciled by the schools in the way they interpret the official policy. This can still be done at this stage within the present framework. It is still possible to call on one policy (individualisation) to counter the pedagogic problems raised by the other (non-streaming, non-differentiation). What has still to be faced is the outcome of a really successful policy of individualisation, vis-à-vis the whole character of the school as such.

Centralisation

It is clear that the Swedes are feeling for ways of making their system less centralised, and among the reasons for this is a belief that this is necessary to release initiative at what may be called the grass roots level.

How Swedish centralism is regarded will depend - to some extent at least - on the eye of the beholder: both the present writers have experience of educational systems in which the power of decision and innovation is much more widely distributed. It is clear what the advantages of central control are. 'When father says "turn" we all turn'. The Swedish Ministry and Board of Education, staffed by skilled experts, is in a position to make things happen. The thoroughness with which the Swedish educational reform has been carried through is eloquent testimony to this. In a relatively small homogeneous country there are clearly limits beyond which it would make no sense to decentralise.

All this having been said, however, it is also easy to see the less favourable consequences of centralised control - particularly in regard to innovation in curriculum and teaching methods. The pressure to change comes from the top. The individual teacher is at the receiving end of a new orthodoxy rather than being encouraged to exploit the creative insights which he derives from his own teaching.

This is recognised by many Swedish administrators in Stockholm - who quote the local development groups (like that at Malmö referred to earlier) as evidence that the point is taken - but it may still be doubted whether in so closely controlled a system the full potential of local initiative and enthusiasm will be realised. This clearly has a direct relevance to the in-service training of teachers. If, as seems likely, this is at its most effective when linked with the active process of curriculum reform and the development of new teaching material, there is still a long way to go.

In Sweden, as elsewhere, innovation makes heavy demands on the teachers themselves who are more likely to embrace new ideas if they are actively participating as valued professionals. There is no reason to suppose that Swedish teachers are more stubborn in resisting change than other teachers, but any major change in educational policy is likely to leave many teachers unpersuaded and this has been the Swedish experience. When this lack of enthusiasm is institutionalised into a tension between the periphery and the centre, it assumes another dimension. (In less homogeneous countries than Sweden, of course, other kinds of local loyalty might be involved.)

More specifically, Swedish centralism raises financial questions about local administration that the Swedes themselves are seeking to answer. The particular method by which the central government pays its 60 per cent share of education costs is under criticism. Being closely tied to the cost of teachers' salaries, it may distort consideration of new teaching methods which might, for example, require fewer teachers and more equipment.

Also, the teachers must tend to look to Stockholm rather than to the locality as their real employer and source of promotion. And not only the teachers: the method by which senior local administrators are appointed is open to the same questioning. For example, the Malmö director of education is, technically, appointed by the King in Council. All this may follow from the slow process of reorganising local government and reducing the total number of local education authorities. But the Swedish experience may not be without its value elsewhere.

Another aspect of centralisation now under discussion in Sweden concerns the method by which the Government should ensure the production and distribution of educational materials. The official policy is to make public funds available for investment in publishing (using the word in its widest sense) and the Government has bought a share in a publishing house together with the local authorities.

The importance of ensuring production, given a strong belief in the Methods-Materials-Systems approach, is obvious enough. How to do this is a question which has exercised curriculum reformers in many countries. Various forms of sponsored publication are possible, of which state publishing is only one. There can clearly be ideological considerations, which may lead some to favour public enterprise in this field as strongly as others will oppose it. The Swedes make it clear that they assume that, for a while at any rate, the State publishing house will only have a small share of the total turnover of educational publishing. But whichever ideological view is taken, the link between a State publishing house and a highly centralised system would become an obstacle to fruitful innovation if it literally gave an imprimatur to new orthodoxies, and restricted the choice of materials available to the schools.

Research and Development

The third aspect of Swedish innovatory technique in education which stands out is the importance given to Research and Development. To some extent it is inevitable that this should tend to be somewhat exaggerated in any description of "rolling reform" as an administrative concept. But any conclusions about Swedish practice would have to stress Research and Development and the faith which is being placed in the social scientists. In this context, this amounts not only to faith in what the social scientists can do now, but also in what they will develop the tools to do in the future.

Here, of course, is an area in which opinion will vary from the more sceptical forms of agnosticism to the more sublime expressions of faith. But this reliance on the social scientists to produce quasi-scientific prescriptions for the curriculum, like the centralised administration, must have an important bearing on the role and function

of the practising teacher. It could be argued, in fact, that the more completely the faith which is being placed in the social scientists is vindicated, the more the present role of the practising teacher is being undermined.

Certainly one of the outstanding tasks is to find ways of contributing to the professional development of teachers while at the same time drawing on the full range of skills which the social scientists have to offer. The involvement of the teacher lies at the centre of the process of curriculum renewal - because what is being aimed at is a change in the whole complex set of relationships which go to make a school, and these depend largely on people, not materials. The materials go a long way to induce and to monitor the changes in social relationships, including the change away from authoritarian attitudes on the part of the teachers. But just as there is more to education than instruction, so there is more to a school than a set of learning systems.

APPENDIX

National Board of Education
Research Planning Bureau (L4)
Stockholm, Sweden.

School Research Projects

1968-69

	Start year	Continues according to present plan until	Estimated costs 1968-69	News letter No.
Instructional Conditions				
Job analyses: teacher training, concerns lecturers in methodology, tutors (and heads), for drawing up educational programme	1967	1971	225	1968:13
Social upbringing: ages 7-16, mapping intended to construct teaching spec. devised to train ability to co-operate, resistance to propaganda, etc.	1967	1971	195	1967:9
Adult education: mapping of adults' study requirements and conditions, intended to draw up effective instructional methods (2 projects covering different fields under way)	1967	1973	150	1967:11
Goals and methods for 6-year olds: analysis of goals, mapping of present nursery school programme in relation to goal analysis, testing of new elements and methods (2 projects covering different fields under way)	1968	1977	100	1969:3
Children with defective sight: registering of problems, attempts to draw up integrated course material	1968			

	Start year	Continues according to present plan until	Estimated costs 1968-69	Newsletter No.
Instructional Processes				
Systematic instructional analysis of teacher and pupil behaviour, intended to bring about more efficient training programme for teacher candidates	1964	1972	170	1969:2
ITV: construction of models for teacher training using TV as an educational technological component system (2 projects covering various fields under way)	1963	1971	290	1967:8 1968:18
ADL: concerns construction of systematic training programme for the severely mentally handicapped	1968	1970	65	1968:8
Gymnastics: mapping of organisation of instruction in order to define improvements	1968	1970	70	
KUMPAN: development of method to register the forms and effects with which various courses planning phases are treated	1968	1971	140	
SIFON: development of methods for guiding and measuring the instructional processes in the lower forms of the comprehensive school	1968	1971	50	1968:20
VGL: development of methods for guiding and measuring of effects in schools with groups of varying sizes and team teaching	1968	1973	20	

	Start year	Continues according to present plan until	Estimated costs 1968-69	Newsletter No.
SESAM: independent work operated by pupils with multi-component materials: testing of study materials and an organisation with individual curricula	1968	1973		
Literature reading in the Higher Secondary School: experiments with new forms of literary instruction	1968	1972		
Effects of Instruction				
GPU: construction of better methods for marking and admission to Higher Secondary Schools	1964	1970	95	1968:5
Youth in Gothenburg: comparing the effects of the senior forms of the Comprehensive School with earlier types of schooling for corresponding age groups	1963	1971	45	1968:14
Adjustment, behaviour, achievement: a study of pupils ill-adjusted to school life in an attempt to define improvements	1964	1976	200	1968:17
Maturing process: describing variations in the maturing process in children aged 9-16	1964	1970	25	1967:12
Study techniques: construction of group tests for measuring independent judgement and productive originality	1968	1971	55	

	Start year	Continues according to present plan until	Estimated costs 1968-69	Newsletter No.
Discernment in studying: the construction of tests as a basis for discernment in studying at county colleges (folkhögskolor)	1967	1970	45	
Individual statistics: analysing links between home background, school structure, choice of studies, school results, etc.	1967	cont'd	45	1968:16
KUL: the development of methods for the qualitative evaluation of teacher training	1968	1974	100	
The effects of marks and methods of work: the importance of various rewards for the pupils' choice of goals, wish to achieve, satisfaction with results, etc.	1968		45	
Development of Systems				
IMU, Mathematics, ages 14-16	1963	1972	670	1968:12
IMT, German, ages 14-16	1965	1973	440	1967:3
IME, English, ages 14-16 (2 projects covering different fields under way)	1965	1970	470	1966:27 1969:4
Civics, ages 14-16	1967	1970	160	1968:19
Religious knowledge, ages 11-13	1967	1971	170	1968:2
SAG, History, ages 17-19	1965	1973	220	1968:11
Education, Teacher training	1968	1972	140	1968:15

	Start year	Continues according to present plan until	Estimated costs 1968-69	Newsletter No.
SMID, Swedish, ages 7-8 for the deaf and those with defective hearing	1964	1972	240	1968:3
School for the handicapped, Swedish, Learning to Read, ages 7-9	1965	1971	125	1968:4
Teach yourself material for pupils with difficulties in learning, Swedish, Mathematics, ages 7-16	1967	1971	185	1969:1
Other Projects				
School in the 1980's: an attempt to determine trends of development with regard to the renewal of educational material and forms of work	1968	1970		
The study packet in educational technology: presenting a concentrated course in educational production to relieve the acute shortage of educational technologists	1968			
Career teaching problems: developing an overlapping theoretical model for research and development work in career education	1968			
Training research and development personnel: training in educational construction technique for subject experts and training in school research		cont'd	250	
Planning, information: coordination and guidance of the continuing expansion of research and development		cont'd	251	
			5,451	