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Abstract

The Swedish National Board of Education, in this newsletter, gives a brief survey of various current projects and offers some points of view on coordination and division of work between different development functions. The work is divided into long-term projects which will contribute to a gradually improved educational technology; and short-term projects in the fields of curricula and instructional material development, which are directed to concrete changes in school work. Some 50 research and development projects are listed, dealing with instructional methods, quality measurement, and planning. (JY)

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EDUCATIONAL RESEARCH AND DEVELOPMENT IN SWEDEN

Plans for 1970/71

In the planning and budgetpapers for the last two years the Swedish National Board of Education (NBE) has presented some partly new ideas about the direction of educational research and development, and also various reasons for a continuous and increased expansion of this activity (School Research Newsletter 1967:2 and 1968:7). In order to avoid repetitions the following survey of the continued assessments made and measures taken in this field has been made relatively concise. The account contains a brief survey of various current projects for a more effective qualitative planning and some points of view on coordination and division of work between different development functions.

The main types of current educational development work as listed in last year's planning paper were

- 1) research and development projects,
- 2) curricula planning,
- 3) development of instruction material, and
- 4) teacher-led experimental activity in various schools.

This division is also following in this report.

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As is the case in most other fields, development work in the school-area is carried on both a short-term and long-term basis. Under the heading of long-term educational development can be grouped the major part of contracted research projects being carried out at various research institutes. This research is not directly related to those improvement activities, e.g. curricula planning, for which there are definite time-tables. The results takes the form of various contributions, large or small, to a gradually improved educational technology, consisting of models and techniques, concepts, principles, factual knowledge of various problems, prototypes etc.

When considering the engagement of the NBE in contract research, one important question which must be asked is if it is possible to create such a cooperation between the public administration and research, that the research costs will give a satisfactory return in the form of tangible improvements in, for example, the administration's innovation and planning techniques, and in the actual working methods of these in schools. The experiences of the NBE during the now six-year-old experimental activity with such cooperation, are definitely positive and it is therefore important that the scope of the activity be increased in accordance with the presented long-term plans. The actual forms which this cooperation take, and which are described in more detail below, are still being developed. It is the opinion of the NBE that one basic aspect is that the most important contribution which research can make to a field of application is not so much in dealing with specific problems with a great degree of attention to detail but rather in the possibilities of relating various practical problems to an overlapping context. Given this point of view, it is natural to aim at wide and long term research activities with close cooperation in planning and often in execution, instead of small limited and isolated projects. In order to be really productive, research of this nature requires certain changes both in the administration and in the research institutes. The former needs to allocate and eventually train staff in order to have sufficient "order capacity". The latter need to cross traditional boundaries between university

subjects in order to create a scientific theory structure which has sufficient relevance for the actual problems in various application areas.

The emphasis in the short-term development work directed to concrete changes in school work, lies in the fields of curricula and instruction material development. These activities, supplemented by teacher training, result in the development and introduction into practical application of new curricula, new working methods and new types of instruction. They form, therefore, the basic functions of the continuous, "rolling" reform work.

In principle, short-term and long-term development work should thus be organized as independent development programmes, running parallel to each other. The coordination between long-term and short-term activities is, of course, important. The results from long-term activities should be incorporated into the time-planned development work with so little delay as possible. And the designs of the various research projects should to a suitable extent be influenced by the needs and problems which exist or arise in curricula planning and in instruction material development. Steps which have been taken or are planned in this connection are described in the section on Research and development.

For curricula planning there is gradually being developed a definite work organization and more stringent methods for dealing with such problems as need analyses, objectives specifications, functional analyses, and media specifications etc. The NBE has now permanent planning groups for the primary and for the secondary schools. Similar activities are planned for teacher training, starting in the budget year 1969/70. Further planning groups of this type, for example for adult education are being considered.

Despite the fact that the work of the NBE in the field of instruction material development has increased considerably during recent years, the NBE expects a very marked increase in activity during the next few years. This is a consequence of the partly

new point of view which the NBE has held for some years, according to which the possibility of schools to guarantee a good standard of instruction can to a large extent be seen as a function of the availability of systematically tested learning materials. Curricula planning and instruction material development should, according to this point of view, be given prominence in school administration just as much as, say, the planning of school buildings. As was stated in last years budget proposal, this expansion brings to the fore, however, several questions of principle dealing with, for example, the forms for making agreements concerning the production of teaching and learning materials. Several production questions which have arisen out of on-going Rand D projects are at present being investigated and considered by the NBE. Furthermore, several current or planned development projects, described in the section on Instruction materials development, will gradually help to create a firmer basis for decisions as to how the NBE's contributions in this new form of development work should be directed and organized.

As has been previously mentioned, development work concerning the schools is very diversified, and the forms for carrying out this work which have been described here, are examples of NBE activities in which new methods are developed and new general principles, directives and recommendations formulated. It is obvious that practical testing is included in this work. Naturally only a small number of schools and classes can be engaged in this. It is, however, important that experimental work should also be carried out as locally organized projects, and it is probable that some problems are best studied in this way. It is the opinion of the NBE that some development work should also in the future be carried out in locally organized development blocks with state subsidies. Resources needed for these activities are specified in the section Development work at certain schools.

II Planned disposition of resources for 1970/71

1 Research and development (R and D)

Some 50 projects are detailed under this heading. Some deal with the development of instruction systems. Some projects are relatively short-term and are mainly exploratory, while others are more long-term. Some projects are, from the research point of view, relatively elementary or conventional, while others involve advances to the present frontier of research or beyond it.

Contract research on this scale is new both for the NBE and for the behavioural science institutes involved. In the space of a few years, activity has reached a scope which seems to be compatible with activities in other fields having a longer tradition of contract research. As an example it can be mentioned that the University Colleges of Technology in 1965-66 had some 5-6 million kronor available for contract research (according to the memorandum "Research Cooperation between Universities and Industry". Office of the Chancellor of Swedish Universities, 1967, page 24). In this context however, reference should be made to the very considerable research, comparable to this contract research, carried out by industry itself. Contract research in the school area is thus still relatively limited.

The planning of this school research programme has taken place in close cooperation between the NBE and the institutes where the work is to be carried out. This means that the research workers required to lead the new projects which are planned to start in 1970-1971 have already in the spring of 1969 declared themselves willing to engage themselves to the degree anticipated in the plans. This commitment has, however, two conditions, firstly that sufficient economic resources are made available and secondly that a decision on this point can be given at the beginning of 1970.

The forms for the planning of contract research projects and their coordination with other educational development work was

described in last year's budget paper. In addition the following can be stated. A number of projects have permanent reference groups with both behavioural science and subject matter specialists. At present there are plans for a more systematic utilization of reference groups in connection with project planning, for example when evaluating plans for project before they are commenced. Research reports which issued by the projects and distributed by the Research Bureau as information to all the relevant working bodies in the NBE have increased considerably in numbers during the year. In addition comments and proposals, based on the contents of the reports, are now regularly requested.

The number of project seminars and conferences with participants from the different departments and planning groups within the NBE has increased in number. On these occasions it is usual for representatives of other research institutes in addition to the one directly concerned, to participate. This is of importance for reducing the isolation mentioned in the previous section between the different scientific disciplines which are of importance for school research.

Requirements for R and D projects have up to now been collected in annual questionnaires submitted to the various departments in the NBE. In future, however, it is intended to allow the planning groups responsible for curricula planning to assemble and evaluate the requirements for research within different sectors of the school system and to specify and discuss them at meetings with representatives for the school research activities.

All the school research projects for 1970-71 are listed, by institutes, in an appendix to this paper. Comments and motivations for the separate projects are given below. The projects are here divided, as they were last year, into two main groups, Instruction methods and Quality measurement, planning etc. The intention of the project list is mainly to show the variation in the problems and aims, and not to form a basis for forming an opinion about the separate projects.

1.1 Instruction methods

The projects dealing with instruction methods such as mathematics (IMU), History (SAG), English (UME) and German (UMF) are probably the best known within the school research programme. These examples have probably contributed to clarify what is meant by a systematic instruction material production and the possibilities which are thus provided to organize instruction with certain guaranteed results as far as knowledge and ability are concerned. It is probably less well known that the instruction methods projects also regularly register and analyse the attitudes and opinions of pupils, and that the pupils participate, by means of conferences of different kinds, in the planning and evaluation of the work.

When in addition to knowledge and proficiency, the objectives for certain part of a course include attitude changes, the production of instruction material should also meet this objective. In principle attitude objectives can be expressed operationally (as registerable "proficiencies") in the same way as knowledge objectives, even if the degree of precision in measurement can, of course, vary with regard to various intended pupil behaviours. It is therefore an important task for R and D projects to develop and improve methods to follow the progress of pupils towards all the various instructional objectives.

Questions of cooperation and social education thus form to a great extent integral parts of the instruction methods projects. The kinds of problems dealt with in this part of the programme can be illustrated by the following list of variables and conditions analysed in the effect investigation of the mathematics (IMU) project (the data will be collected in the period 1968-1971).

- 1 The pupils' knowledge and proficiencies with regard to
- a mathematics
 - b reading proficiency and study techniques

- c planning and taking responsibility
- d cooperating with other pupils, teachers and assistants

The experiences of pupils, teachers, assistants and headmasters with regard to

- a the contents of the courses
- b the material
- c working methods
- d forms of organization
- e school situations

Descriptions of rationalization effects on

- a teacher requirement
- b requirement for assistant staff
- c problems of planning the course
- d premises
- e total costs for mathematics teaching

Description of

- a scope and appearance of the material, legibility, vocabulary and illustrations
- b solution frequencies for all problems
- c results of diagnostic tests and test problems, item analyses of tests and normalization
- d time required for the various components
- e the opinions of pupils about various parts of the system, for example mental arithmetic exercises, taped repetitions and the D-components
- f the opinions of teachers and assistants about various parts of the system
- g the opinion of parents about the system

5

Description of school work with reference to

- a detailed accounts of the activities of pupils during a normal lesson, such as how long they take in different types of activities etc.
- b teachers activities: job evaluation, observations
- c activities of the assistant, job evaluation, observations.

One common factor in the instruction methods projects financed by the NBE is that they aim at creating the possibility of individualizing according to the pupils' study abilities and interests. A number of projects are, according to the present plan, aimed at defining the pre-conditions for instruction. In such cases the project may be limited to the specification of objectives, and to a planning in principle of instruction and media needed, expressed in prototype form. This sort of activity, as far as some of the projects are concerned, can be carried out for several years within the school research programme before a definite decision needs to be taken as to whether the project will eventually be followed up by commercial production and marketing.

For further details about the instruction methods projects, reference should be made to last year's planning paper, to the NBE Newsletters, the relevant issue number being given in a separate column in the project list, and to the research reports referred to in the newsletters.

In one field where has been difficult to obtain suitable proposals the NBE has commissioned a preliminary survey and planning. An account of this has recently been given (L Sjödaahl: Vocational Instruction Research. The Institutes of Education and Psychology, Malmö, March 1969 /in Swedish/). Work on one or two of the project proposals listed there is expected to commence in consultation with the NBE subject experts during the year 1969-1970.

R and D projects dealing with various problems in teaching training have been commenced at several different research institutes. Another group of projects, partly related to teacher training

projects, are those dealing with the training of research and development staff, training in educational technology, etc.

Production and testing of a study package in educational technology is in progress, in cooperation with the research unit of the Office of the Chancellor of Swedish Universities. Efforts are being made to regenerate and systemize both contents and methods used in various courses of educational technology, e.g. for teacher training candidates; teacher training staff, subject matter experts engaged in educational planning and in the production of instruction material, etc.

A summary for these 43 current projects, of which 34 are in progress and nine are new, and which are all based on the plans and calculations drawn up by the responsible research staff, shows for the budget year 1970/71 a requirement for 9 970 000 kronor for research and development concerning instruction methods.

1.2 Quality measurement, planning etc.

One task of the research and development work in the field of education is to design tests and methods which make it possible to carry out relevant measurements in various education situations. There is probably a long way to go before a systematic instruction evaluation is generally achieved. The situation in Swedish schools is roughly the same as that existing in the U.S.A. where a newly published public report states that at the moment there is practically no knowledge as to the extent to which educational objectives are in fact reached.

The NBE school research programme comprises a number of projects aiming at developing tests which will assess the effect of school work on children not only as far as knowledge and ability are concerned, but also for social characteristics, motivation and other social human values. Most of these projects were detailed in last year's budget paper, to which reference should be made.

Among the new projects for the 1970-71 period is one called

Educational Assessment (School of Education, Umeå). In some respects, this resembles an American project, National Assessment of Educational Progress, within the scope of which tests for some ten different fields (including reading, civics, art and music) have been developed during a 5 year period. From 1969 these tests will provide representative data for four different age groups (9-year-olds, 13-year-olds, 17-year-olds and 26-35-year-olds).

In order to complete the projects already in progress, and to carry out the extension of activities mentioned in this paper, the NBE calculates that the cost for research and development in the field of quality measurement, planning etc, will be 2 130 000 kronor in the period 1970-71.

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and

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Current and planned school research projects

1 000 of kronor

Institute	Project	Start year	Continues acc. to the present plan until	Costs up to 68/69	Planned costs 69/70	Planned costs 70/71	Latent newsletter no.
LHG	1 SISU. Self-instructional material for pupils with learning difficulties. Swedish, Mathematics. Ages 7-16.	1967	1971	245	136	300	1969:1
	2 DPPA. Systematic instruction analysis. Deals with teacher and pupil behaviour, aims at formulating a more effective educational programme for teacher candidates.	1964	1972	340	146	280	1969:2
	3 Objectives and methods for 6-year-olds. Analysis of objectives. Survey of the present nursery school programme in relation to the objectives, testing of new elements and methods (2 projects are currently in progress in different aspects of this subject).	1968	1977	55	200	310	1969:3
	4 Micro-teaching. Development of methods for analysis of, and instruction on, the effects of various teacher behaviour patterns.	1970	-	-	-	240	
	5 Literature reading. Ages 7-16. Formulation and testing of methods, instructions etc.	1969	-	-	50	190	
	6 GUME. English. Comparative analysis of the effects of theoretical explanations and pure structure exercises.	1968	1970	200	145	-	1969:4

Institute	Project	Start year	Continues acc. to the present plan until	Costs up to 68/69	Planned costs 69/70	Planned costs 70/71	Latest newsletter no.
LHL	1 Reading research. Studies the effects of systematic teaching of reading and writing in the nursery school.	1969		--	280		
LHM	1 IMU. Mathematics. Ages 14-16. Method system development.	1963	1972	1 738	580	680	1968:12
	2 UMT. German. Ages 14-16. Method system development.	1965	1973	1 200	330	440	1967:3
	3 Social education. Ages 7-16. Survey to draw up a programme specially intended to train cooperation abilities, resistance to propaganda, etc.	1967	1971	290	210	290	1967:9
	4 Job analysis. Teacher training. Concerns methods teachers, tutors and headmasters in order to draw up training programmes.	1967	1971	318	250	260	1968:13
	5 Creativity. Designing of group tests to measure independent judgement, and productive originality.	1968	1971	62	100	230	
	6 ITV. Drawing up of models for teacher training where ITV is utilized as an educational sub-system. (2 projects are currently in progress on different aspects of this subject.)	1963	1971	349	200	420	1967:8
	7 Educational technology. Teacher training. Method system development.	1968	1972	140	250	390	1968:15

Institute	Project	Start year	Continues acc. to the present plan until	Costs up to 68/69	Planned costs 69/70	Planned costs 70/71	Latest newsletter no.
8	VGL. Development of methods for checking and assessing effects in schools with various group sizes and with team teaching.	1968	1973	20	90	190	
9	Pupil democracy. Systematic development of methods for cooperative planning, etc.	1968		-	90	170	
10	Vocational training problems. To develop an overlapping theoretical model for R and D in vocational education.	1969		-	115	400	
11	Swedish. Ages 11-13. Drawing up of prototype methods and exercises in lessons and lesson series.	1970		-	-	210	
12	Reading technique and word comprehension. Ages 17-19. Systematic development of methods for exercises in reading technique, study technique etc.	1970		-	-	160	
LHS 1	SAG. History. Ages 17-19. Method system development.	1965	1973	990	200	350	1968:11
2	Religious knowledge. Ages 11-13. Method system development.	1967	1971	250	190	250	1968:2
3	ITV. See LHM:6.	1964	1971	371	135	160	1968:18
4	Maturity process. Describes variations in the development of maturity in children from 9 to 16 years.	1964	1971	111	12	60	1967:12

Institute	Project	Start year	Continues acc. to the present plan until	Costs up to 68/69	Planned costs 69/70	Planned costs 70/71	Latest newsletter no.
5	Adult Education. Survey of study requirements and opportunities for adults in order to draw up effective teaching methods. (2 projects are currently in progress in this field.)	1968	1973	65	100	190	
6	Goals and methods for 6-year-olds. See LHG:3.	1968	1977	45	100	210	1969:7
7	KUL. Development of methods for qualitative assessment of teacher training.	1968	1974	140	160	230	1969:6
8	SESAM. Pupil controlled work with multi-component material. Testing of study material and an organization with an individual study.	1968	1973	--	50	240	
9	Västmanland. Study. Survey and analysis of the educational and vocational choices of the pupils of one year (a continuation of + LHUm:1.)	1970				100	
10	UME. English. Ages 14-16. Method system development.	1965	1970	739	175	--	1966:34
11	The school in the 1980's. An attempt to define the trends in development in fields such as the renewal of the curriculum and in working methods.	1968	1970	30	50	--	
LHUm	1 GPU. Developing better methods for setting marks and for entrance to secondary school.	1964	1971	339	100	60	1968:5

Institute	Project	Start year	Continues acc. to the present plan until	Costs up to 68/69	Planned costs 69/70	Planned costs 70/71	Latest newsletter no.
2	Physical training. Survey of instruction methods in order to specify improvements.	1968	1971	90	46	80	
3	Cooperation in schools. Development of methods for pupil participation in planning, instruction and evaluation.	1970	--	--	--	110	
4	Marking. An investigation of the effect of marks on the pupils' knowledge, interest etc.	1970	--	--	--	80	
5	Elementary instruction in orientation. Method system development.	1970	--	--	--	110	
6	Educational assessment. Development of methods for an over-all evaluation of the effects of the work carried out in school.	1970	--	--	--	210	
7	Study evaluation. Making up tests to be used in folk high schools.	1967	1970	70	40	--	
LHU	1 SMID. Swedish (7-8-year-olds), for deaf children and those with impaired hearing. Method system development.	1964	1972	573	120	180	1968:3
2	School for the handicapped, Swedish, learning to read. (7-9-year-olds). Method system development.	1965	1971	422	90	120	1968:4
3	Children with defective vision. Summary of the problems and an attempt to formulate integrated course material.	1969	--	--	58	220	
4	English. Ages 7-9. Method system development.	1969	--	--	35	280	1969:5

Institute	Project	Start year	Continues acc. to the present plan until	Costs up to 68/69	Planned costs 69/70	Planned costs 70/71	Latest newsletter no.
PeG	1 Civics. Ages 14-16. Method system development.	1967	1971	210	130	200	1968:19
	2 Youth in Gothenburg. Comparing the effects of the upper division of the comprehensive school with previous school types for corresponding age groups.	1963	1971	149	55	100	1968:14
	3 Individual statistics. To analyse the relationship between home background, school structure, subject preferences, school results etc.	1967		90	55	100	1968:16
	4 KUMPAN. Development of methods to register in what way, and with what results, different course phases are dealt with.	1968	1971	155	160	310	
	5 Literature reading. Ages 17-19. An experiment with new methods of literature instruction.	1968	1972	13	70	180	
	6 Study packet in educational technology. To present a concentrated pre produced course in order to alleviate the acute shortage of instructional technicians.	1968	1970	30	40	-	1969:8
PeL	ADL. The drawing up of systematic training programmes for severely mentally handicapped children.	1968	1971	65	70	120	1968:8
PeU	Adult Education. See LHS:5.	1967	1973	165	102	130	

Institute	Project	Start year	Continues acc. to present plan until	Costs up to 68/69	Planned costs 69/70	Planned costs 70/71	Latest newsletter no.
PSS	1 Adjustment, behaviour, achievement. A study of pupils ill-adjusted to school life in order to specify improvements.	1964	1976	639	265	290	1968:17
	2 Maturity in vocational selection. Method system development.	1970		--	--	180	
PCS	1 SIFON. The development of methods for directing and testing the instructional process. Ages 7-9.	1968	1971	50	30	220	1968:20
	2 Reading training. Ages 10-12. Method system development.	1970		--	--	190	
L 4	1 Qualitative evaluation methods in vocational training.	1968		--	50	100	
	2 Training of research and development staff. Training in educational design for subject experts and training of researchers.				400	500	
	3 Planning. Pilot studies, etc.			600	420	400	
	4 Following-up of projects. Information.						
Total (in thousands of kronor)				6 400	12 100		

Research institutes. LHG, LHLi, LHM, LHS, LHU, LHU = institutes of educational research at schools of education in Gothenburg, Linköping, Malmö, Stockholm, Umeå and Uppsala.
 PeG, PeL, PeU = institutes of educational psychology at universities of Gothenburg, Lund and Uppsala.
 PSS = psychological laboratories, Stockholm university.
 PCS = Educational innovation centre, Stockholm.