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ABSTRACT

In connection with the first simulation exercise of the Council of Europe's EUDISED project carried out in the field of research and development in education, national agencies were asked to provide 5-page reports on completed research and pilot projects. The Netherlands report covers 12 projects, providing for each the theme, project team, background and aims, present status, recommendations, and bibliographies. Topics covered include an inventory and analysis of problems related to lowering the nursery school age; designing and testing a compensatory preschool program; development of objectives of modern math instruction; the task of the teacher in secondary education; educational system construction; and creativity and cognitive style of students in postsecondary schools. (SK)

COUNCIL OF EUROPE

EUDISED R & D INFORMATION

NETHERLANDS

Experimental
Issue
1975

DOCUMENTATION CENTRE FOR EDUCATION IN EUROPE

P R E F A C E

The Council of Europe's EUDISED Project aims at the creation of a European Documentation and Information System for Education which will take the form of a computer-based network of national agencies co-operating with a central agency. After two feasibility studies had been published in 1969 and 1971, and the multilingual EUDISED Thesaurus and the EUDISED Format issued in 1973/74, the system was experimentally tested by simulation exercises in 1974/75.

The first simulation exercise was carried out in the field of educational research and development to which all member governments attach a particular importance. A sample totalling some 250 projects of on-going and completed research including pilot projects of research-based educational development and innovation, from ten member states, was recorded and abstracted on a common worksheet derived from the EUDISED Format and indexed with descriptors taken from the EUDISED Thesaurus. The worksheets were processed at the British Library and the computer print-outs published by the Documentation Centre for Education in Europe as an experimental EUDISED R & D Bulletin 1975.

At the same time national agencies which had completed the worksheets were asked to provide in either English or French more detailed reports of some five typewritten pages each on completed research and pilot projects. Such reports were obtained from:

H. Schwanda	Austria
L. Legrand	France
R. Mayer	Federal Republic of Germany
R. Hellner	Denmark
I. Mottier-Holz	Netherlands
R. Kristiansen	Norway
E. Egger	Switzerland.

The aim of the reports is to complement the information which is given on the worksheets, held at present in the central data-base and published in the Bulletin. Only those projects, it was agreed, should be reported upon which were closely connected with educational policy and development. The reports are addressed not only to researchers and academics but in the first instance to decision-makers and administrators, inspectors and teacher-trainers, in brief to all those who bear public responsibility for the improvement of education. They have therefore been written, as a rule, not by researchers but by information officers and documentalists in a language which should be understandable by the layman without distorting the scientific content and the scientific material on which they are based.

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Such reports of completed research and research-based pilot projects of educational development and innovation exist already in some countries, e.g. in Sweden and the United Kingdom. In other countries, like Austria and Switzerland, the publication of such reports is in preparation. It is therefore to be hoped that all European countries participating in the EUDISED Project will in the near future regularly issue - apart from the brief abstracts contained in the data-bases - such reports, which would constitute a current information system for a broad public. The reports might take the form of national R & D News-letters. They should be distributed widely at home and abroad and should, to facilitate communication, be published not only in the national language but also, if different, in English and French.

The Documentation Centre for Education in Europe herewith publishes the reports received as part of the experimental EUDISED exercise and expresses its sincere gratitude to the authors for their contributions.

The reader's indulgence is asked for the form: budgetary constraints allowed only for publication as working material for the national agencies and experts co-operating in the EUDISED Project. The reader will, it is hoped, also bear in mind that this has been an experiment and a first step in a new activity.

Strasbourg
April 1975

Documentation Centre
for Education in Europe
Council of Europe
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CONTENTS

Theme: Inventory and analysis of problems related to an eventual lowering of the entrance age for nursery school

Project team: Kohnstamm Institute for Educational Research, Amsterdam

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Background and aims

In November 1972, Mr C F Schelfhout, State Secretary for Education and Science at that time, asked the Netherlands Foundation for educational research to recommend a research institute which would be able to study the problems pertaining to the lowering of the entrance age for nursery school. Until now the entrance age has always been four years of age. The Kohnstamm Institute for Educational Research and the Day Nurseries Research Centre accepted to conduct the study. Working parties from the two organisations combined to form a project team to analyse the problems. The team placed special emphasis on the need for the inventory and analysis to take into account the consequences which lowering the nursery school entrance age would have for the teaching and the organisational aspects of training and education for two- and three-year-olds and four- and five-year-olds respectively. The team was also of the opinion that attention should be given to the social situation which had given rise to the demand to lower the entrance age.

In the course of their study, the team also looked at the question of a restricted lowering of the entrance age to 3.9 years, an idea in which Mr van Kemenade, the Minister of Education and Science was interested.

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Description of the present situation

The investigation began with a survey of the play centre and nursery school situation in the Netherlands and in neighbouring countries. The team's report discusses the activities of the Netherlands Children's Centres Working Community, an umbrella organisation to which almost one thousand play centres are affiliated. It also deals with the problems of financing and running such centres, and discusses a draft bill relating to play centres.

There are two reasons for children attending play centres. Firstly, there are the child-oriented reasons (in the interests of the child whose home circumstances are such as to constitute a threat to his development). The literature on this subject has many references to this, but research has found little proof of its validity. The second reason, which is mother-, wife-and family-oriented, springs largely from the increase in the number of married women who go out to work.

In Belgium more than 80 per cent of 3-year-olds attend nursery school, while in Britain the Government plans to provide additional nursery school facilities. Some parents fear that the extension of official nursery school facilities to younger children will diminish their own role as parents.

The report, in dealing with nursery schools, also gives statistics and further information on the instruction provided, school buildings and equipment, and the conditions governing admission.

The Montessori schools are discussed in a separate section, and similar treatment is given to the training of nursery school teachers and to the psychosomatic and educational services provided.

Judging by their arguments, the ideas on lowering the admission age to play centres and nursery schools often seem to be based on personal conviction rather than on scientifically proven facts.

Recommendations

The project team drew up a great number of recommendations.

They are against generally lowering the entrance age because the provision of various educational facilities of different types alongside one another is desirable. Efforts should be made, however, to arrive at an integrated education policy with one single system of educational facilities. Nor do they consider it desirable, in the present circumstances, for the entrance age to be lowered to the age of 3.9. It would be of greater value to improve the present situation.

The team recommend that the size of nursery school classes should be further reduced and that four-year-olds should not be required to be present for a minimum of 60 per cent of the school day.

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Grants for play centres attended chiefly by children from the lower income groups should be raised. Further recommendations are made regarding the training of nursery school teachers and child care workers, while the team also feel that communication between staff members and those responsible for running play centres and nursery schools should be improved.

Experiments should be carried out in the nursery school teacher-training schools, where special attention should be given to working with three- and four-year-olds. The team is further in favour of experiments in co-operation between nursery schools and play centres. Those experiments should include development activities, notably the development of plans of action.

Further research is necessary, especially:

- inventory-type surveys of play centres;
- comparative studies involving similar institutions in other countries;
- research on parent participation;
- surveys of educational motivation.

The team also recommend that interdepartmental policy be more clearly outlined so as to promote the co-ordination of experiments, development work and research, and the dissemination of the results of innovative experiments.

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Studie ter inventarisatie en analyse van problemen verbonden aan een eventuele verlaging van de toelatingsleeftijd voor het kleuteronderwijs (Inventory and Analysis of Problems Connected with Lowering the Entrance Age for Nursery School). Volumes A, B, C and D, and appendices. Kohnstamm Institute for Educational Research and Day Nurseries Research Centre, Amsterdam, 1974.

Theme:	Designing and testing of a compensatory pre-school programme for socio-economically disadvantaged children
Project team:	G.A. Kohnstamm A.K. de Vries J. Rupp J. Teunissen
Research projet carried out at :	State University of Utrecht Foundation Research Institute for Learning Difficulties State University Trans 14 Utrecht

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The Utrecht Compensatory Programme

Van Heek's study "The hidden talent" was published in the Netherlands in 1968. The lack of participation by children of unskilled workers in secondary education was investigated in this publication under different hypotheses. Furthermore Kohnstamm in his standardization of the Utrecht Language Level Test (UTANT) demonstrated that great differences were found in linguistic competence between children of different social categories by the age of six already.

During the period 1965-1970 several enrichment programmes were designed in the Netherlands. The Utrecht Compensatory Programme, begun in 1968, may be seen as the second in which serious attempts to evaluate results were undertaken. It consisted of three divisions:

- family-participation programme (J. Rupp);
- language and thought programme (G.A. Kohnstamm and A.K. de Vries);
- school-readiness programme (J. Teunissen).

Each of the three divisions of the Compensatory Programme was evaluated with the same dependent measures.

The evaluation design can be described in terms of Campbell and Stanley's taxonomy as a static group comparison. The test scores of children having experienced one of the conditions of the Compensatory Programme were compared with the test scores of children who had not had a compensatory education experience.

Within one year, the weakness of this design became manifest and an attempt was made to change to a classical pretest-posttest control group design. This was possible, because for some groups of children the enrichment activities had not yet begun so that unbiased pretest scores could still be collected.

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However, even this change could not rescue the evaluation programme. It was only due to the secondary effort of a summative evaluation, especially designed for the language and thought portion of the Compensatory Programme, that evaluation of this part became possible.

The Language and Thought Programme

The roots of the experimental language and thought programme are found in Bereiter and Engelmann's programme for "Teaching Disadvantaged Children in Pre-school". However, during the pre-experimental period the content of the language and thought portion programme grew away from the Bereiter and Engelmann programme.

With the help of two subtests from the Utrecht Language Level Test (UTANT), children were chosen who did not show much lack of intelligence, but who were obviously handicapped in their ability to understand language and to speak fluently.

Goals were formulated to fit the static group comparison model at the end of Kindergarten. Besides the expectation that the experimental group would attain higher average scores than the control group, a more specific goal had also been formulated in the language field; the experimental group was expected to attain scores on the UTANT comparable to the scores attained by children whose parents received modern secondary education. And second, with respect to the development of thought, the experimental group would have intelligence-test scores equal to the average of the Dutch standard population. It was realized however that attaining these goals would not be a guarantee of success in elementary school for the children.

Exercises

The programme exercises consisted of different parts. The first part was a series of exercises inviting children who were not used to speaking in complete sentences to express themselves in such sentences. This was done first with imitation exercises using simple sentences of seven to eight words. In the second part came exercises in which the children were invited spontaneously to produce sentences with a co-ordinate clause and finally there were exercises in which they were asked to produce spoken language to describe a series of connected events.

Results

The results of a pre-posttest comparison and a comparison with a control group showed statistically significant gains for the experimental group, both in the number of complete sentences used and in the average number of words per sentence. The decrease in incomplete sentences so characteristic of the spontaneous language of these children, can be seen as a sign of the success of the treatment.

Another pretest-posttest control group design was carried out with two control groups and the experimental group. One of the control groups got systematic attention but of a different type than the specific language and reasoning activating exercises developed for the experimental group. The result revealed significant gains for the experimental group in the comprehension and use of lexical-semantic units.

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As for the long-term effect, the activation programme was of no special influence on the reading test scores in the first and second form of the primary school. Although positive results were obtained, the goals formulated as: 1) average language scores comparable with the scores of children whose parents received modern secondary education, and 2) intelligence-test scores equal to the average of the Dutch standard population, were both not obtained.

Since January 1974 a team of researchers from Utrecht started a new project in Kindergarten and primary school, called "differentiated education" (GEON), which will be tried out during the next six years.

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Theme:	Inventarisation and development of objectives for modern mathematics instruction in primary education
Project leader:	H P Stroomberg
Research carried out at:	Research Institute of Applied Psychology, Prinzengracht 299-307, Amsterdam

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Introduction

The project was designed to investigate educational objectives with the aim of drawing up firm guidelines for the schools. Special emphasis was placed from the outset on joint educational objectives. The school subject chosen for the project was mathematics, and an endeavour was made to determine what objectives of present-day instruction should be retained rights through to the end of the period of compulsory school attendance and what new objectives should be introduced. The project was carried out mainly between 1966 and 1970.

Methodological aspects

1. Study of the objectives. The following activities were carried out:

- A provisional inventory of the objectives of mathematical instruction was compiled.
- The inventory was discussed with specialist working parties.
- A discussion paper was compiled on the basis of the result of the discussions.
- The reactions to the discussion paper were incorporated into the study.
- Multiple-choice items were constructed to assist in studying the objectives.
- A method of analysis was drawn up.
- Random samples were taken of relevant respondents.
- A questionnaire was sent out.
- The results were analysed.

To gain a better idea of the objectives to be introduced, 25 specialists were interviewed and their statements on objectives were analysed.

2. Methodology of the objectives study. The objectives to emerge from this investigation were, briefly:

- to encourage objective - and plan - motivated thinking;
- to increase the proficiency with which educational aims are formulated, specified and made operational;
- to promote the use of the aims, thus formulated and made operational, in consultations, discussions and decision-making concerning education;
- to work out what type of methodology should be used in the "objectives" study;
- to find a suitable form for presenting the results of the "objectives" study;
- to use the analysis for policy and innovation decisions and for evaluation, curriculum research, et

In addition to the operational objectives, there are objectives or "activities" which have not been made operational. The latter are objectives which have been formulated in terms of "activities" which pupils are required to perform as part of their educational courses.

3. Planning educational objectives. Several plans were drawn up. One difficulty encountered in classifying the objectives was that too little was known of the pupils' level of proficiency. This problem has not yet been solved. Attention was also given to a mathematics project for primary schools known as the "Wiskobas project".

4. An inventory of the objectives in the teaching of arithmetic. This was carried out with the aid of arithmetic items in primary school tests for the years 1966 to 1970 (National Institute for the Development of Educational Tests). The items were regarded as examples of operational objectives, and the skills developed on the basis of the items were regarded as examples of concrete objectives.

The inventory was recast as a discussion paper with the aid of a group of primary school teachers and a group of secondary school teachers. It was sent to 691 persons, together with a questionnaire, which was answered by 306 respondents, who added many suggestions of their own. The result was a more effective method of analysis (the discussion paper) and a growth of professional interest in the material content of the objectives.

5. Questionnaire. The respondents were asked to give their opinion on the presentation and formulation of the objectives. The comments showed that primary and secondary school teachers took a more positive attitude to the discussion paper than members of school advisory services and lecturers in colleges of education. The results confirmed the impression that there was a great deal of misunderstanding with regard to the study of objectives, and it proved necessary to set out anew the points of departure, which were listed as follows:

- What are joint objectives?
- What are minimum objectives?
- The significance of differentiation;
- The formulation of objectives in terms of skills;
- The restriction or extension of the required skills;
- The function of the inventory;
- Repeating the study of objectives at fixed intervals;
- The view that top priority should be given to establishing joint objectives;
- The relation between a study of objectives and other research projects;
- The aim of the project;
- Views concerning modes of teaching;
- Views concerning the ideal education system.

Teachers tend to approve of this type of approach, because it is a "concrete" approach. The list of objectives is probably of immediate and practical use for this group. Those with a fairly critical attitude towards the approach were the members of school advisory services and those in charge of working groups on the "Wiskobas" project. These groups seemed to be more interested in the research method than in the results obtained.

6. Method of analysis. This was developed on the basis of the data collected. In its final form, it consisted of three arithmetic study tests (110 items) embodying the objectives. It was sent to the respondents, together with a questionnaire for evaluating the method of testing. The tests were administered to 1,011 pupils and the results showed that at least 19 items per test of the pupils' test (comprising 36 and 37 items) failed to meet the expected "p-values" criterion (for random sample 3 (15 year-olds) p was 0.90; for random samples 1 and 2 (highest primary school classes in Amsterdam) p was 0.80 and 0.70).

These items were further classified according to behaviour level in accordance with the National Assessment Classification. Most of the items were found to belong to behaviour level 2.

Finally, the fifteen-year-olds' achievements and opinions on the items were compared and found to show a fairly high degree of correlation. Their opinion of the items was very positive.

Result of test questionnaire: at least 90 per cent of the relevant respondents agreed with the criterion that a joint objective and a minimum objective should be established for primary school leavers. 44 of the 130 "concrete" objectives could be regarded as minimum objectives for the end of primary school. This also proved to be the case with 34 of the 110 items (operational objectives). As the

list of objectives was specially compiled for the final year of compulsory education, it was gratifying to find that 90 per cent of the respondents considered 108 of the 130 objectives for this level to be acceptable. The same applied to 87 of the 110 items.

7. Conclusions

1. Secondary teachers require fewer objectives than primary teachers. Teachers in technical schools appear to set their sights higher with regard to arithmetic skills than teachers in lower domestic science schools. Teacher-training college lecturers demand a higher standard - though not much higher - for primary school leavers. Parents tend to have higher expectations than teachers with regard to their children's level of achievement. Not too much significance should be attributed to this, however, in view of the way in which the random sample of parents was selected.

2. The list of objectives and the accompanying tests may be regarded as being reasonably valid for present-day arithmetic instruction.

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Theme: Biology and environmental conservancy education in the primary school

Researcher: J. C. van Noordwijk-van Veen

Background

The Committee of Ministers of the Council of Europe adopted a resolution on June 31 1971 in which the governments of member states are recommended to introduce the principles of nature conservation and ecology into their educational programmes at all levels and in all appropriate disciplines. The reason was the conviction that ecology is the scientific basis of a new attitude towards nature and of a rational management of natural resources. The citizens of each country must therefore be provided with the necessary elements of knowledge to enable them to shoulder the responsibilities relating to the preservation of their environment.

In this regard it is important that nature conservation education should begin in primary schools, and that secondary education can build on the results. Only then will it be possible to have a sufficient understanding in the population as a whole for the necessity of conservation measures, however unpopular they may be in themselves.

In the thesis here reported information was gathered about biology teaching and the attention given to environmental problems in primary schools during 1971, by means of a survey in a 10% sample of all Dutch primary schools.

Research design

On the basis of this information the knowledge of and the attitude towards environmental problems of the 10 to 11 year old pupils of 75 primary schools was tested. The schools were divided into groups according to the following criteria:

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1. The care and maintenance of aquaria and animals inside the classroom by the pupils.

2. The participation of pupils in school gardening and nature study excursions.

3. The theoretical teaching of at least two pollution problems.

4. The combination of 1 and 2.

5. The combination of 1 and 3.

6. A group of schools used as controls where none of the above mentioned activities took place.

A third survey was made among the biology teachers at the Teacher Training Colleges, to get an impression of the extent to which and the way in which the future teachers are trained for the teaching of biology and environmental conservancy education.

From the data of the surveys an estimate was made of the present situation and the possibilities for improvement. In relation to this working visits were paid to England and Sweden to see whether environmental conservancy education is already in use in these countries, and how much of their experience can be adapted for Dutch schools.

Results

In 1971 the average teacher in the fifth form of the primary schools was a male between 25 and 35 years of age, who qualified as a teacher later than 1960. He did not feel sufficiently prepared for the appropriate biology teaching. He had not given special attention to biology and did not belong to an organisation for nature conservancy. The teacher thought biology is important for the primary school and had ethical as well as practical reasons for this.

The average fifth form had one hour of biology every week. The probability of the pupils using their own biology book was slightly greater than that of their being taught without school books. The pupils took care of plants in the classroom. A little more than half the pupils were involved in the maintenance of aquaria and other animals in the classroom. Almost 50% of the pupils took part in excursions or school gardening.

Attention was paid to environmental problems, usually initiated by the immediacy of a problem or by questions of the pupils. Half of the classes gave attention to water pollution. The Nature Conservancy Year had, according to the teachers, no persistent influence on the attention to be paid to pollution problems in future.

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There was no possibility of getting help from a school biologist or advisor for the majority of the teachers.

From a second questionnaire it was concluded that the fifth form pupils had no knowledge of the history of nature reserves, but they knew the meaning of the word. They were interested in a membership of a nature conservancy organisation, the more so when their teacher was a member. They knew the significance of the Waddenzee as a nature reserve. They did not intend to use herbicides in their own gardens, and to a lesser extent this also applies to chemicals against snails in their gardens. These pupils did not know the composition of air nor did they understand air pollution. They had an idea about the significance of water and water pollution. They knew less about a food chain than was expected from their teachers' information.

Conclusions

The differences in the answers between the six groups led to the following conclusions. The level of knowledge of environmental problems and the attitude towards nature of the pupils are improved by:

- their caring for animals and aquaria in the classroom;
- the theoretical teaching of two or more environmental problems.

When care of animals in the classroom is combined with either school gardening and excursions or the teaching of environmental subjects the results improve greatly.

From a third survey it was learned that two-thirds of the biology teachers at the Teacher Training Colleges were fully qualified for biology teaching, and took their degree within the past ten years. The freedom of choice of subjects for teaching had as a result that not a single topic was chosen by half or more of the teachers.

The problems related to the maintenance of living material in the classroom by pupils were known to at least half the students as far as plants and aquaria are concerned; the problems related to the maintenance of small mammals, birds and terraria were unknown to most students.

Environmental problems are discussed in most Training Colleges, usually during the biology lessons, but knowledge about these problems is not yet considered to be part of the curriculum. The college teachers consider the time available for biology far too little; however they think that within the existing time limits environmental problems receive enough attention.

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Comparisons

The study discusses also the main books used in the Training Colleges, some recent reports on primary school education and a number of organisations which organise help for the teaching of biology in or outside the primary schools.

The attention given to biology and environmental conservancy for pupils up to 11 years of age in seven English schools is described. Especially the environmental education as it is practised in Leicestershire was found of great interest. The environmental conservancy message is implicit in the environmental education, where material including living material is used to stimulate the children's curiosity and therefore their learning.

In Sweden the organisation of education is more centralised. Biology plays an important role in the new curriculum for the nine year compulsory school, partly because the Swedish School Board is aware of the importance of the biological understanding of the environmental problems. The recommended curriculum shows close similarities with the environmental education in Leicestershire.

Comparison of the English and the Swedish experience with the Dutch survey results led to the following conclusions:

1. Environmental education which includes the contact with living material in the classroom and outdoor activities in nature appears to be the best possible means for attaining the required general environmental conservancy education.

2. If a well-defined experiment on environmental education were to be carried out in Dutch schools, other goals than the biological ones should be especially evaluated.

Finally, recommendations are given for the improvement of biology and environmental conservancy education as long as the above conclusions have not yet been acted upon. The most important one is the recommendation to make biology a major subject in the first two years of the Teacher Training College.

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Theme:	The global-bilingual and the visualising procedure for the transfer of meaning in foreign language teaching
Research carried out at:	Christelijk Pedagogisch Studiecentrum, Hoevelaken
Project leader:	Tjeerd Meijer
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Background

One of the main learning activities in the initial stages of foreign language teaching is that of semantic identification. Various didactic procedures can be applied to enable pupils to realise this identification.

In this study, which is concerned in particular with the initial stages of the teaching of French, two procedures of semantic transfer are compared, viz the bilingual procedure where French sentences are explained by means of Dutch equivalents in translation, and the visualising procedure, where this is done with the aid of visible means such as pictures, actions, mimicry and gestures. In the experiment both procedures were global in their application in that each involved complete French utterances from dialogues. Since the opinion is sometimes expressed that visualising semantic transfer procedures are more suitable for more talented than for less talented pupils, two experimental classes were composed in such a way that it was possible to examine this secondary aspect by effecting a corresponding spread in the differences in ability.

The global bilingual procedure for the transfer of meaning found frequent application from the Middle Ages until well into the 19th century, not only in the teaching of Latin but also in teaching modern languages. Although the grammar translation method, more elementary bilingual and analytic-synthetical in nature,

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was the one prevalent in 19th century modern language teaching, it represented in fact only one of various possible combinations of indirect teaching techniques. By the end of the 19th century, psychological and practical considerations frequently caused direct procedures for the transfer of meaning to be adopted as well. Due to disappointing experiences they were largely superseded again by eclectic mixtures of bilingual and monolingual procedures in the early years of the 20th century.

Under the influence of new trends in linguistics and educational psychology they acquired renewed interest after the Second World War, first in America and later also in Europe, and appeared especially in combination with the new audio means (gramophone record, magnetic tape and language laboratory).

Scientific research in this field may be considered to constitute a contribution towards the solution of an urgent and relevant educational problem.

Methodological problems

The following problems are especially relevant: applied semantic transfer procedures; the stages of the learning process; the translatability and visualisability of texts; direct identification as a psycho-linguistic problem; "visual" memory; the nature of "translating" in applying the global-bilingual procedure; translation habits and automatic responses; receptive learning and interference phenomena.

Hypotheses

Rejection of the extreme view that translations into the mother tongue of texts in the foreign language can never be regarded as the equivalents of these texts: they can in most cases provide a clearer reflection of the meaning than visual means can do. Along with many language didacticians the validity of the view is questioned that the visual means may lead to direct identification. It is shown that, on psycho-linguistic and experimental grounds, a genuine mediatory role of the native tongue must be considered a probability.

Considerations based on educational and thought psychology lead to the rejection of the view that the "visual memory" retains foreign language subject matter considerably better when visualising procedures are applied. The introduction of native tongue equivalents in applying the bilingual transfer procedure has nothing to do with active word-by-word translations by pupils; any increase in frustrating influences on automatic response processes or any increase in cases of external interference need hardly be expected.

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The application of visualising procedures, especially in the case of less gifted pupils, carries with it certain dangers for an exact identification of lexical, morphological and syntactic semantic contents, which may result in "mechanical" linguistic utterances of very low use potential in fresh situations and which are easily forgotten.

Organisation of the experiment

Two experimental classes were formed (first year of secondary general education). For reasons of organisation within the school it was necessary for one class to be made up of 20 girls and 10 boys and the other of 20 boys and 10 girls. This was no major problem, since consultation of relevant literature showed that in the field of foreign language learning within-sex differences are generally greater than between-sex differences.

During one year, one class was taught according to the global audio-bilingual method. French sentences were presented with their complete Dutch written equivalents. During the exploitation phase Dutch was also used in the structured exercises.

The other class was taught according to the audio-visual method and listened only to French. Explanation by the teacher was given in French. Teaching materials were those collected by the French language centre CREDIF (Centre de recherche et d'étude pour la diffusion du français) in the method "Voix et images de France" (VIF).

During the experiment several tests were administered.

1. Achievement tests
   - Reproductive tests, intended to test the subject matter involved (oral production tests, translation tests, word tests, sentence sequence tests and spelling tests).
   - Application tests, directed at testing the ability to apply the subject matter taught in slightly altered situations of language use (listening-comprehension and reading-comprehension tests, a French-into-Dutch translation test, sentence-sequence tests, speaking ability and writing ability tests, fill-in tests, retention tests and a pronunciation test).
2. Psycho-linguistic tests (retrospective questionnaires, an association test, an initial test and two linguistic-feeling tests).
3. Motivation, interest and attitude tests.

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Conclusions

Averages on the scores of the different tests administered justify the conclusion, as regards the primary aim of the study, that the audio-bilingual class appeared to have acquired more knowledge and skills, both with regard to the French subject matter taught and the application of this subject matter in changed situations, than the audio-visual class and that the global bilingual semantic transfer procedure appeared to have been more effective than the visualising procedure.

As regards the person variable, which was introduced, it may be stated that, as far as applicative and reproductive knowledge and skills are concerned, the greatest differences for the translation tests and the word tests occurred between the least talented sub-categories. The audio-visual semantic transfer procedure was in effect less suitable for less talented pupils than for more talented ones.

As regards retention it was shown that, once certain portions of French subject matter had been properly mastered, no significant differences in retention occurred between the audio-bilingual and the audio-visual class, so that no confirmation was found of any possible additional effect of the so-called "visual memory" in favour of knowledge acquired by means of visualising procedures.

From the results of the interest, motivation and attitude tests it may be concluded that the level of interest in the subject, the lessons and the teacher showed little fluctuation, as did the level of motivation; these levels can generally be said to have remained constant, with the exception of interest in the subject, which showed a slight decline in both classes.

The most striking feature in the analysis of errors is that the application of the global-bilingual procedure did not result in more external-interference errors from the Dutch but that the external-interference errors in the audio-visual class were even higher, although these differences were not significant.

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Theme:	Experimental construction of tests relating to language performance in the mother tongue
Project leader:	H Wesdorp
Research carried out at:	Research Institute of Applied Psychology Priusengraarht 299-307 Amsterdam

Introduction

The project was organised with a view to developing an efficient and reliable method of assessing written language skills of final-year primary school pupils in their mother tongue. "Efficient" is used here in the sense that the assessment procedure should not demand an excessive amount of time and manpower, and "reliable" in the sense that there should be certain minimum standards of accuracy which the assessment procedures should meet.

The project was concentrated on the assessment of essays written in the mother tongue and was based on the fact that the current method of assessing written language skills is highly unreliable and far from objective. A study of articles written on the subject yielded the following methods of assessing such skills:

1. The direct method (pupils write essays);
2. The indirect method:
   a. semi-objective marking possible (pupils complete or correct texts);
   b. objective marking possible :
      - tests for integrated skills;
      - tests for a number of separate skills.

It was decided to design two "indirect method" tests, one that could be marked semi-objectively (an interlinear test) and one for integrated skills that could be marked objectively. Furthermore, it was decided to perfect the "direct method" so as to establish a criterion for measuring the validity of the other two tests.

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First stage (1969-70)

In connection with perfecting the direct method, the possibility of establishing a valid and reliable criterion was investigated. It appeared that an acceptable criterion could be established, provided the latter was based on the opinion of a sufficiently large team of all-round assessors, and certainly if, when making the appraisal, each pupil was judged on several essays. This general method of assessment was preferred to a rating scale or an analytical assessment method, since they both are very costly and not very reliable.

A pilot study (105 essays and 16 assessors: with re-assessment approximately three months later) showed that the assessment was roughly 95% reliable and the marking roughly 85% reliable, if about five members of the panel were chosen to assess about five essays. The selection of assessors on the basis of their stability and their "type" proved to be of little value for the time being.

It was decided to establish a language-oriented criterion for written language skills. To this end twelve tests were devised, pre-tested and then condensed to form four syntactical tests (SA, SB, SC and SD).

Second stage (1970-71)

Instruments to measure written language skills (using the "indirect method") were developed. Information from various sources (including the results of an analysis of the mistakes made in 433 essays) was used in drawing up test specifications. The final test specifications were divided into five main categories:

1. language conventions (spelling, punctuation, use of capital letters);
2. Grammatical sentence structure;
3. Suitable and effective use of language (choice of words, style);
4. Organisation;
5. Content.

After pre-testing, two objective writing skill tests containing 50 items (CA and OB), two semi-objective interlinear tests containing 70 items (IA and IB) and a "punctuation and capital letters" test containing 60 items (IP) were compiled.

Third stage (1971-72)

Results obtained from the experimental tests (CA, OB, IA and IP) were compared with the education-oriented (OC) and language-oriented (LC) criteria.

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Comparison was also made with a number of "traditional" language tests. A total of 211 pupils from 7 schools took part in the "validity" study. All tests were completed and the children wrote five essays between 23 August and 21 December 1971. The essays, on various subjects, were marked by five assessors.

The results showed that OC and LC were highly reliable, as proved to be the case in all tests. It was also clear from the results that both the experimental and the traditional tests were better at predicting LC than OC, and at the same time they were not superior to LC in predicting OC. Further findings were that:

1. OA, OB, IA and IB predicted the essay criterion (OC) reasonably well (mean validity approximately 67);

2. combinations of two or three experimental tests predicted OC better than combinations of traditional tests;

3. combinations of two or more experimental tests predicted a four-essay criterion better than an essay which had only been marked once but not better than an essay which had been marked five times.

All in all, OC, LC, experimental tests and traditional tests seemed to show a fairly high degree of mutual interdependence, and in any case more than had been expected on theoretical grounds. The attempt to predict OC seemed to succeed reasonably well.

Fourth stage (1972-73)

A validity control study analogous to that carried out in the third stage, with only a few slight differences, was carried out with a random sample of 393 pupils from 20 schools. The results obtained were much the same as those of the first validity study. The validity of the various tests and combinations of tests in relation to OC was found to be the same, or even greater, than that found in the previous investigation.

Evaluation

The project has made a valuable contribution to the field of test construction, notably on the following points:

1. The validity level of the experimental tests proved to be superior to that of single essays.

2. The activation of various related skills proved to be less successful. More research is needed to determine how these skills can be put to optimum use.

3. The actual operational capacity of some of the main language skills, in cases which can be clearly distinguished by measuring techniques, should for the moment be approached with a certain amount of reserve.

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Theme:	The task of the teacher in secondary education
Research carried out at:	Vis and Malotaux Organisation and Efficiency Bureau, Bilthoven Institute of Applied Sociology, Catholic University, Nymegen
Project leaders:	J A van Kemenade J P A Pouwels P Ch A. Malotaux J Vis
Project team:	Working parties from Vis and Malotaux Bureau, Institute of Applied Sociology, Ministry of Education and Sciences, Nieuwe Uitleg 1, The Hague.

Background

In July 1969 the Secondary School Teachers Council was informed that the question of the extent to which the introduction of the Secondary Education Act had brought about a structural increase in the work load of teachers was to be investigated in a project including an analysis of the nature, extent and intensity of the work of secondary school teachers. The project was commissioned in September 1969 by the then Minister of Education and Sciences, Dr G H Veringa, in consultation with the Minister of Agriculture and Fisheries, Mr P Lardinois, and was carried out under the supervision of a committee composed of representatives of teacher organisations and of the two ministries concerned.

Objective and methods

The general aim of the project was "to provide information to serve as a basis for optimalising the duties of the secondary school teacher, in matters of staff and materials". Some three thousand teachers in all branches of secondary education took part in the investigation, which was conducted between 15 March 1970 and February 1971. In a written questionnaire prepared by the Institute of Applied Sociology they provided detailed information on the nature and extent of their work and the number of working hours.

In the same period the Vis and Malotaux Bureau carried out an observation study among 60 teachers, whose activities were studied throughout the whole of one day. The aim was to have a second source of information on teacher duties and to check the data obtained from the questionnaire to see whether it reflected adequately the actual teaching situation.

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Research results

- Number of working hours per week. Full-time teachers are employed on the basis of an average 35.54-hour working week (covering a total of 29 teaching or related units), or 1,865 hours per year. The number of working hours differs widely from one type of school to the other. Calculated on the basis of the standard 35.54-hour week, lecturers in colleges of education work the longest hours (39.11 hours per week, or 2,038 hours per year), followed by teachers in intermediate general secondary schools (37.15 hours per week, or 1,937 hours per year), teachers in pre-university and higher general secondary schools (36.59 hours per week, or 1,923 hours per year) and teachers in agricultural and horticultural schools (36.03 hours per week, or 1,875 hours per year). The shortest hours are found in domestic science schools (35.42 hours per week, or 1,856 hours per year) higher secondary technical schools (34.50 hours per week, or 1,811 hours per year), lower secondary technical schools (34.10 hours per week, or 1,777 hours per year), post-secondary technical schools (32.23 hours per week, or 1,684 hours per year).

- Nature of the work. Three groups may be distinguished:

1. Teachers who devote less than half their working hours to teaching and more than half to other school activities (17%).

2. Teachers who devote a half to three-quarters of their working hours to teaching and between a quarter and a half to other duties (61%).

3. Teachers who devote three-quarters or more of their working hours to teaching and less than a quarter to other duties (22%).

Teachers belonging to the first group have much more extensive duties than those belonging to the third group. It may be concluded from this that teachers with many other duties in addition to teaching usually have a much longer working week than those whose duties are largely confined to teaching.

- Intensity of the work. The research findings show that 24% of the respondents work under stress varying from severe to very severe. The stress found among teachers is little different from that experienced by other occupational groups for which relevant data are available, such as industrial workers, female employees and office personnel. Comparable data show that absenteeism among teachers is no greater than that among other occupational groups.

Only 15 per cent of the teachers in the observation study gave educational innovations as the reason for the stress accompanying their occupation, while 35 per cent were of the opinion that it was caused by the pupils. Other reasons mentioned in the observation study were "one's duties" (15%), the time-table (15%), personality

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factors (8 %) and other factors (11%). The reasons given for finding their other duties strenuous were personal duties (39%), educational innovations (37%), the organisation and working with others (12%), personality factors (18%) and other factors (4%).

- Attitude to teaching. The findings suggest that the higher the educational level of the school, the less teachers are concerned with the personality development of their pupils. They tend to attach greater importance to assimilation of the subjects taught.

There were two opposing views also on teacher-pupil relationships. Only 14% of the teachers attached importance to pupils working independently, half of them emphasised the pupils' dependence on their teachers, and the remainder (36%) occupied an intermediate position. The younger the pupils, the greater the emphasis placed on their dependence. Teachers active at the higher educational levels attached greater importance to high scholastic achievement, although they still paid a great deal of attention to educational methods.

Observation of their classroom behaviour showed, however, that they are in fact more subject matter-oriented than their attitude indicated. On an average, there is no difference between attitude and behaviour as regards the place of the teacher in the school organisation.

- Differences. The three factors affecting the nature and the length of the teacher's working week are the post he occupies, the subjects he teaches and the type of school in which he is employed. Yet these factors do not explain the differences found which, in addition to personal physical or mental traits of the teacher, may arise from factors such as the intellectual level and the composition of the classes taught ("difficult" or "easy" classes), the incentive for personal involvement, provided by the school (colleagues and school authorities), and individual differences in working methods and tempo.

Teachers of Dutch, foreign languages and the exact sciences usually have to devote more time to preparation and marking than teachers of other subjects. Teachers in positions of authority in "schools in transition" (experimental schools) have a comparatively heavy work load. Educational innovations place a heavy burden on a comparatively small group of teachers, notably those in positions of authority.

- Changes advocated by the teachers. Asked whether the present total of 29 teaching units for full-time teachers should be retained, 60% of the respondents answered in the negative. They urged that these working hours be reduced. Teachers in pre-university, higher general secondary and intermediate general secondary school, and lecturers in colleges of education were prominent in this respect. Asked what hours they were in favour of, they gave 26 to 27 hours for second and third grade schools, and 22 to 24 hours for first grade schools.

Forty per cent of the respondents proved to be advocates of a 40-hour working week; 60% preferred the present system. Many college of education lecturers (71%) were in favour of a full working week. The majority of those in favour of effecting this change were teachers with a very full teaching time-table or with many general or co-ordinating duties.

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Possibilities for the optimalisation of the task of secondary school teachers

Some important problems which have been uncovered by the investigation are the spreading of the weekly working hours, the unequal distribution of the work load, a discrepancy between attitudes and actual behaviour, and the structure of teacher duties.

It is doubtful whether the extra burden borne by some teachers can be removed simply by changing the length of the working week or allocating more or fewer teaching units. Such measures might bring some relief as a temporary solution for the most pressing problems, but in the long term they can only be fully solved by a task and organisation structure which facilitates and promotes continuous educational reform.

The subjects taught in the schools are now in process of renewal, as are also teaching methods and the individualisation of instruction, all of which have their consequences for the organisation, of the schools. The latter must be given the scope they need if they are to succeed in bringing about a continuous process of change. A policy aimed at improving the lot of theteacher will have to be based on a greater degree of decentralisation.

Perhaps the most radical change proposed to date is that the present system of a standard number of teaching periods (29 units at present) should be replaced by a full working week, as yet unspecified. The number of teachers to be appointed would then be determined on the basis of a teacher-pupil ratio, and the duties of each teacher would be decided upon by the school authorities according to a task and organisation model approved by the school community. This would mean the re-institution - in a different form - of a system which operated in the past, when schools were smaller, in which the teachers were responsible as a team for everything to do with school life.

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Theme: Study or employment - motives of choice of male pupils

Researcher: Jos.G.M.Yland

Introduction

This study mentions the following types of secondary schools which exist, among others, in the Netherlands and for which, for the sake of brevity, the Dutch abbreviations are used throughout.

ULO and MAVO	Schools for secondary general education at intermediate level. (4-year course.)
MBO	School for vocational training at intermediate level. (Courses varying from 2 to 4 years.)
HAVO	A school for secondary general education at higher level. (5-year course.)
Atheneum	A school roughly comparable to an English grammar school. Completion of the six-year course can lead to university entry.

In the Netherlands full-time schooling is compulsory up to the age of 15.

Theoretical background

The study aims to investigate the motives of male pupils of ULO schools in choosing between the various types of further schooling, or alternatively, immediate employment. The survey is followed by a study of their experiences one year after having made their choice.

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According to Lazarsfeld, Ginzberg and Super the choice between types of schooling or of employment is a developmental process. Schein and Argyris state that taking up employment can be considered as a psychological "contract", in that the mutual expectations of the employer and the employee are then confronted. Hill and Trist have shown that the commencement of any job will entail a process of adaptation, combined at the start with a high degree of mobility - the induction crisis. However, according to Miller and Form, a high degree of mobility at the age of ULO school-leavers is a normal feature of development.

The survey

A comparison is made between boys who opted for further schooling, and those who took up employment after successfully completing the ULO school course.

At first discussion focuses upon the plans made by the ULO pupils six months before taking their school-leaving examinations, their occupational aspirations, their affinity for the occupation they wished to pursue, and finally, their expectations regarding their prospective employment environment.

Most of the boys planned to continue their education after passing their ULO school-leaving examination. The career plans of this group were more clearly defined than those of the group proposing to enter employment immediately. Those having clearly defined plans were usually those who had preferences regarding their future occupation.

The occupational affinity of ULO school-leavers showed pronounced development compared with that of first-grade pupils.

Pupils of ULO schools have, generally speaking, very similar expectations regarding their prospective employment. They tend to attach great importance to matters extraneous to the job itself, such as congenial working conditions. (Extrinsic factors.)

Next the choice ultimately made after passing the school-leaving examinations is compared with previous plans. Those continuing their education usually proceeded according to their original plan. This was less often the case in respect of those taking up immediate employment. The pupils who continued their education were more highly motivated in making their decision.

Those taking up immediate employment were, as a group, most frequently assisted by others in making their choice. Expecially in choosing a job, assistance given by the father was greater than that given by the school staff. The school had little influence on the transition from school to the workaday world, but a greater influence on a decision to proceed to some form of further schooling.

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Conclusions

In general, those taking up immediate employment knew very little about their prospective work, or the business organisation which they were entering, despite the fact that they had taken such advice as was available. This fact prompts a number of suggestions directed towards improving the vocational guidance available during secondary education.

The intelligence, personal characteristics, school results and home background of those continuing their schooling, are compared with the characteristics of those taking up immediate employment. Van Heek's investigations, and the comments and criticisms thereon, revealed contradictory results regarding the influence of home environment on the type of activity, educational or otherwise, chosen to follow primary education. These results are discussed, and compared with the findings of the enquiry at secondary school level.

At this level it was again found that decisions to proceed to further education were closely related to the home environment of the pupils. The prime factor in encouraging further schooling is the professional and/or occupational status of the father, followed by socio-economic considerations and the pupils' personal characteristics. Following Floud's definition, the educogenous family is described as one with an educative climate which fosters the social and intellectual values of education, and in which the children are positively encouraged in their development of such attitudes.

For many children compensation programmes can provide opportunities for educational improvement.

In considering the results achieved by pupils who continued schooling and their comments on their experiences, no differences were observed in the attainment after one year's schooling, irrespective of the selection procedure on leaving the ULO school, and of the motivation differences. Extra-curricular activities were found to have no bearing on scholastic achievement. Review of the efficiency comparisons leads to the conclusion that the majority of pupils who took the HAVO or Atheneum courses after having completed ULO, could have proceeded to HAVO or Atheneum direct from primary school.

Two decision situations may be distinguished at the end of the first year of further schooling. Decisions in respect of in-school matters, for example, as to whether to leave school, repeat a year's course, or to proceed to the following year, depend for their success primarily on personality factors.

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At this educational level decision situations which tend to be of a domestic nature, such as whether schooling should be continued at an alternative school, or whether employment should be sought, reveal a clear association with the professional and/or occupational status of the father.

Career ambition levels are related to the choice of school course. There is a marked difference between the ambitions of those continuing their education, whatever their choice of programme, and those entering employment immediately on completion of the ULO course. The latter are prepared to be content with a much lower status in society. Career ambition levels are also related to the father's occupational status. A marked inter-relation exists between ambition levels, the father's occupational status, and the type of schooling chosen.

After a year of work the preferences of the boys had undergone a considerable change with regard to the importance or unimportance of factors connected with their employment. Before starting work, extrinsic factors influenced their thinking. After a year, intrinsic factors were found to carry greater weight.

Divergence is evident between theory and practice. It is thus proposed that a scheme of compulsory part-time education be introduced in order to bridge this gap, and the gap between school itself and the workaday world. If this is not done, the gap will continue to exist irrespective of the period during which the changover is delayed by further schooling.

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Theme:	Reasons for which parents send their children to protestant schools
Research team:	J de Jonge D J Flamen T Westra
Research carried out at:	Institute of Applied Social Research, Free (Protestant) University, Prins Hendriklaan 27-29, Amsterdam.

Introduction

One of the characteristics of the Dutch education system is "verzuiling", that is the way in which separate "pillars" of education have emerged in the distinction that is made between Protestant, Catholic and nondenominational education. The project described here is an inquiry into the reasons why parents send their children to Protestant schools, based on four central themes:

- What kind of motives prompt parents to choose Protestant schools?
- What are their expectations with regard to a Protestant education?
- Have parents' motives remained unchanged over the years?
- What policy proposals can be made on the basis of the research results?

The investigation

1,050 parents of children at Protestant schools were approached for personal interviews. Of these 776 (73.8%) agreed to take part. The result showed that there were three reasons for sending children to Protestant schools:

- The Protestant character of the school. Protestant schools allow for the teaching of Christian principles and beliefs in the formative training and education of the child.
- The sectarian mentality. The parents are church members and wish to avoid the confusion that could arise in the child if what he is taught at school is not in keeping with the home situation.
- The school atmosphere. The principal point here is that Protestant education is primarily directed towards the development and happiness of the child.

Interviews, group discussions and publications revealed a number of expectations:

- Preparation for religious festivals (Easter, Christmas, etc),
- Religious instruction based on the Bible,
- Study of other religious beliefs,
- Comparison of the Gospel and reality inside and outside the school,
- Teaching methods different from those of state schools.

A gradual shift in attitudes to Protestant education has taken place over the years. The Bible is still important, but no longer has to be learnt by heart. Attention is now devoted to biblical values such as justice and solidarity, and more attention is bestowed on attitudes like kindness to others and social and political awareness. Teachers are less authoritarian in their relationships with pupils and the teaching of history is less national and more world-oriented.

Conclusions

The results indicate the direction future policy could take. As many parents are opposed to co-operation with other denominational schools, this should be approached with reserve and care should be taken to ensure where possible that Protestant schools retain their identity. Specific aims should be developed not only with regard to outward forms but also with regard to such matters as society, mental attitudes of teachers and the content to be taught in subjects such as religion, history, biology, social studies, geography and Dutch.

The investigation clearly shows that church membership plays an important part in parents' choice of school. This means that the religious background of parents and pupils should be reflected in the educational aims of the school. The fact that the different churches hold finely-shaded views on upbringing and other social standards and values serves to strengthen the belief that all these different views should be reflected in the objectives of different Protestant schools. Consequently, there is not just "one" type of Protestant school, a fact which should be taken into account in regional education planning.

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Theme:	Applicants who fail to gain admission to university (Students drawn out by lots)
Project leader:	J Wagemakers
Research carried out at:	Higher Education Research Institute, Catholic University, Orangesingel 41, Nymegen.

Introduction

I. A shortage of university places in recent years has made it necessary to introduce a balloting system for admission. Many applicants fail to gain admission to the more popular courses of study such as medicine and dentistry, with no guarantee of their being more successful the following year.

Description of the project, its methods and conclusions

II. In 1974, those responsible for providing guidance and assistance to first-year students at the Catholic University, Nymegen, invited last year's unsuccessful applicants to attend a conference at which they could air their problems and receive assistance wherever possible. The participants were divided into groups of 7 or 8, under two group leaders, and an information booth was placed at their disposal where they could seek answeres to specific questions. The ideas originated from the activities of student counsellors and the Nymegen Municipal Vocational Guidance Centre.

III. A survey carried out among those present revealed that 53 per cent wished to study medicine, 20 per cent history, 11 per cent dentistry, 7 per cent English, and 7 per cent Dutch. 10 per cent had in the past been registered in the university, and 8 per cent had already attended a higher vocational education institution. Only 3 per cent stated that they had not known about the balloting system. 50 per cent still had no doubts about their choice of subject being correct, 30 per cent were less sure, and 14 per cent were by no means sure. 85 per cent stated that they intended to reapply for admission to the same course of study in the next academic year; only 12 per cent said they would not reapply.

Their educational background and their secondary school achievements were not different from those of successful candidates for admission.

The students who had failed to gain admission were also asked to answer a number of questions concerning their particular problems. The principal problem proved to be the choice of subject. Feelings of depression, anxiety and uncertainty were also listed, though feelings of this kind are mostly connected with age and can also be found among first-year students who have been accepted.

The matter of the subject they wished to study had been discussed principally with friends (89 per cent) and with parents (83 per cent). 69 per cent had also consulted other students, but only 45 per cent had talked it over with school counsellors.

Their personal characteristics were compared with those of first-year students in an endeavour to ascertain whether they might be considered to be a special group. The sole difference found in this respect was that fate ("the balloting") had been unkind.

One of the main points to emerge from the group discussions was that they had been informed too late of the balloting results. In addition, it became clear that the secondary schools do not seem able to cope with helping their pupils to decide upon a suitable field of study; it seems that school counsellors have too little opportunity to give pupils guidance.

IV. The participants in the Nymegen conference were found on the basis of their discussions with group leaders and with each other to fall roughly into three categories:

- those who had become firmer in their conviction that their original choice of subject was correct;
- those who had come to realise that their present choice was a flash in the pan and had reverted to their original choice;
- those who had given up their first choice but did not know where to go from there.

It would appear inadvisable therefore, to urge all prospective students to have a second subject to fall back upon. They should, however, fully realise that they may fail to gain admission to university.

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Theme:	Educational system construction: individualisation and feedback in higher education
Project team:	W.Verreck L.H.Braak
Research carried out at:	Eindhoven Technological University Technological University Educational Research Group Insulindelaan 2 Eindhoven

Background

The recent interest in application of and research into individualised educational systems at the Eindhoven University of Technology and elsewhere is placed against the background of two developments. First the type of research in which the Educational Research Group of the University has been engaged is outlined. Often, the result was to disprove or to weaken supposed relations in the teaching-learning process. The second development concerned the comparative research of teaching methods. This type of research appeared to be very much in vogue during the last few decades, but it yielded few consistent results.

Hypotheses

A short enumeration of recent individualised educational systems is given. It is contended that there are at least three assumptions underlying these systems. The evidence for each of the assumptions has been examined.

The first assumption is that the learning process is furthered by dividing the subject matter into smaller units. Setting aside the problems of definition and size of units, the evidence in an educational setting appeared to be scarce. Results from experimental psychology, especially concerning memory processes, offered more support. Replication of these results in an educational setting, however, remains desirable.

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The second assumption is that the learning process is furthered by taking into account individual differences in abilities, interests, personality traits, etc. It is especially this topic in which great interest has been taken in the last few years. Research results, however, have hardly supported the assumption so far. The only consistent result seems to be individual differences in the rate of study for distinct tasks.

The third assumption is that the learning process is furthered by feedback to the student about the shortcomings in his mastery of the subject matter. In this respect there is often no clear distinction between informative and motivating functions. In the latter case one speaks of "reinforcement", and in the former case of "feedback". The results give the impression that some delay in feedback can be more effective. Special feedback seems to produce more effect than more general feedback. Supposedly, the operation of feedback gives structure to recently stored information. Responding to the questions and solving problems can in this way be conceived as feedback.

Experiments in the area of meaningful verbal learning and the effect on this learning of questions about the text are discussed in this context. In this way a relation is created with the corresponding operation of "advance organisers", summaries, prequestions etc.

Preceeding research

Next, an evaluation is presented of the results of applications of and research into individualised educational systems in higher education. Summaries of these articles are given in an appendix. It is pointed out that methodological objections might be made against most of these publications. Some results, however, are rather consistent. Achievements are generally very good.

Regular study seems to be an important contributing factor to success. Great differences in rate of study usually show up. Determination of individual speed is generally rated positively, but does not appear to be necessary to success in every case. Preference for individual rate is related to personality traits, but not to achievement. There are indications that an individualised system is especially favourable to slow students and to students with lower marks and more school experience. The feeling of competence seems to be fostered by it. The general attitude of the students is positive. A common phenomenon is the lagging behind of a number of students.

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Experimental courses

In the second part of the study the evaluation of a similar course is described. It deals with a course in applied mechanics (statics) for first-year students of mechanical engineering. The course was given in almost the same way for two years in succession: 12 study-units in a linear structure, individual rate of study, a test for every unit with retesting possibilities, and no decisive examination at the end. A comparison between the two years was thus also possible.

A great amount of data was collected in advance: school marks, previous schooling, cognitive tests, a few personality traits. During the course data were collected about the progress, the achievements and the subjective judgement on a number of aspects of the course. Data to be collected after the course were: achievement on a final test and on examinations in other subjects, and a subjective judgement of the course as a whole.

The composition of the two groups did not differ as to previous schooling. The second group (W71) had a lower mean score than the first group (W70) for some school marks and some cognitive abilities. This made a comparison of course achievements more difficult. The groups did not differ in personality traits. The various sets of input variables (school marks, cognitive abilities, personality traits) showed hardly any interconnection. It did appear that students with more fore-knowledge (higher technical school) attained a higher score in a number of ability tests which correlated also higher with course achievements.

Evaluation

The process data showed that, as regards difficulty, the interrelations of the study-units of one year corresponded reasonably well to those of the other. Predictability of the final achievement in one unit in virtue of the results for previous units was often poor. A prediction based on anything other than some of the most recent units was often useless. From this it was derived that the units were reasonably complete parts of the subject matter. Some structural coherence among the units was, however, demonstrated: a distinct mechanics component and indications of new subject matter component (factual knowledge), and of a mechanical engineering component.

The time needed to complete a test differed considerably per unit. Significant positive correlations between test times for the various units were an indication of individual differences in the required test times. Because the correlations were far from perfect, the possibility of individual differences in difficulty of the various units was not excluded. Test time did not correlate with test score. The time used before making the

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first test of the next unit (study time) showed hardly any relation between the various units. The time needed to complete a unit (unit time) also showed little relationship among the units. The time necessary for studying a unit was reported by the students to have especially been spent on the literature and on study questions. It differed on the average for each unit. The periods of time spent on similar study tasks in different units generally correlated very positively, just like the times spent on different study tasks within the same unit. This was again considered to be an indication of individual differences in required study time, differentiated by study task. Students who finished a unit early attained higher scores, even when the last test trial of all students was taken into consideration.

Results

A number of striking differences between W70 and W71 formed an indication of another approach of the course by W71. This group needed more trials for each unit, but used less test time for the first as well as for the final test trial. Progress in the course, expressed in terms of the number of completed units, appeared to be less for W71 than for W70. The mean time needed to study each unit was generally higher for W71. Subjective response to the course was less positive with W71. The students of this group developed less testing skill, consulted each other less, and had greater need of guidance from the teacher. All this indicates a lower capacity to study independently, or, what seems more probable, an improper study strategy. It is supposed that W71 followed the strategy of using the first trial in order to get acquainted with the questions. In this way time was gained in the next test trial, but it took longer before a unit was completed. At the end of the course they were pressed for time and the number of trials for each unit did not differ any more from W70.

By means of canonical analysis some relations between school marks and unit performance were shown, as also between cognitive abilities and unit performances. The relations appeared to be unstable on cross validation.

Previous schooling showed distinct effects: the students from higher technical schools attained higher scores than those without this special technical training; they finished earlier, and needed fewer test trials.

The speed with which the course was completed, achievements in the final test and in examinations in other subjects during the same semester showed high inter-correlations. Form this it was derived that the same abilities play a part in this course as in other courses. The students generally judged the course positively. They appreciated the individual speed, and would like other courses to be set up on the same lines. They experienced no influence on their performance in the case of other subjects. The tests formed the most important feedback to the students.

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With W71 there were more students who dropped out (20% against 12% with W70). Dropped-out students did not differ on input traits from those who completed the course. However, they attained lower test scores from the start and it took them longer to complete a unit, although they did not need more test trials.

The efficiency of the course, judged by the number of students who finished it, was high: 88% for W70 and 78% for W71. In previous years only about 50% passed the examination within one semester. Quality was also higher than in previous years, seeing the mean score in a final test. This final test was comparable to previous examinations and in addition was made without extended study.

A considerable investment of time was made by the teacher to set up the course (this decreases). Financial outlay involved payment of assistants for managing the course. The students, however, did not have to spend more time on the course than on more traditional teaching projects. Neither were there obvious indications that performance in other subjects deviated from those in the course.

In the discussion attention is drawn to certain aspects of the course which have to be constantly checked to enable the course to be evaluated. Finally, some possibilities are suggested for further research into such educational systems.

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Theme:	Creativity and cognitive style - a study of post-secondary students
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Background

The study reported in this thesis is primarily concerned with the relationship between creativity and cognitive style. More specifically the study is directed at the characteristics of cognitive processes in young persons who choose art as a style of life.

Creativity is a term used in many different ways. At least two dimensions in creativity must be distinguished: one pointing to objective results and the other pointing to subjective satisfaction. Along these dimensions various creative activities can be registered according to their value and newness for the society and the person.

Cognitive styles are defined as specific individual modes of information processing which are relatively stable over time and are embedded in and related to a broader context of cognition and personality. This concept of cognitive style is seen against a background of knowledge about cognitive processes in general and cognitive development in particular.

With respect to cognition in general, special attention is given to the processes of selection, construction and transformation in perception, memory and communication. These are relevant to individual and cultural differences in cognition and expression, which are of special interest to the study of creativity. The concept of a "filter" as a permeable barrier between cognition and reality is considered as particularly useful here.

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In this study creativity means artistic creativity of post-secondary students with a subjective component being prominent.

The research

The study deals primarily with two groups of art students. One group (27 males, 10 females) attended the informal, non-confirmist, and with respect to students, heterogeneous "Free Academy of Art", The Hague (now called "Psychopolis"), while the other group (20 males, 20 females) came from the more formal and demanding "Royal Academy of Art" (The Hague) which offers a more conventional and structured programme. Two types of control (or "contrast") groups of comparable age and educational level participated in the study. The first control group was more technically oriented and included engineering students (10 males) and students from a chemical technicians course (10 females). The orientation of the other group was more verbal and social; this group consisted of students of a teachers college (10 males and 10 females).

In the battery of tests measures of convergent and divergent thinking were included, as well as tests for field-independence, categorising style, figure drawing ability, risk taking and impulsivity. In addition, written autobiographies were collected. Most tests were objectively scorable; those tests in which subjective judgements and contamination effects might have raised problems were scored by two independent raters, who were not informed about the students or the groups to which the students belonged.

Differences in mean scores of the groups were used as a first approximation for a group description. Statistically, most conclusions were based on a canonical analysis of discriminance. The first of the three axes, obtained by this analysis, was rotated as to maximise the differences between the art and non-art groups (the "art-dimension"); and the second as to maximise the differences between the males and the females (the "sex-dimension"). After rotation, the third demension reflected mainly differences between the control groups (the "contrast-dimension").

The measure of convergent thinking, for which four subtests of the "Groninger Intelligentie Test" (an individual intelligence test validated for a Dutch population) were used, revealed no differences between the groups in intelligence level. As generally is the case with the Groninger Intelligence Test, sex differences were found, the females scoring consistently lower. Probably the rigorous multiple-choice form of the test and the decision-processes involved, explain this sex-difference, for in the divergent thinking task females performed on the same level as males.

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To measure verbal-divergent thinking, essay-type answers were collected for one item of Guilford's consequences test. Productivity in this verbal task loaded mainly on the contrast-dimension, separating the teachers' college students (verbal-productive) and the female chemical technicians. Originality and emotionality however loaded on the art dimension. The students in art, especially the males in the Free Academy of Art expressed both emotional and rational answers of greater variety.

Often divergent thinking is equaled to creative thinking. From the results so far obtained it may be concluded that this standpoint is too unspecific: persons who can think creatively in a certain field (as the art students do) might well be only average or even less than average in divergent thinking outside their particular field of interest.

Field independence, or "the ability to keep things separate in experience", was measured by two tasks: Witkin's Embedded Figures Test and a group embedded figures task from Cattell's O-A battery. Although for Witkins task sex differences in the expected direction were found (males more field independent), it appeared that both embedded figures tests loaded mainly on the art-dimension. Interestingly, large differences were found between the two art groups, the students of the Free Academy scoring in the field independent direction, indicating a more global perception, and a strong influence of feelings on thought and perception. On the other hand, the unconventional, unstructured programme of the Free Academy obviously attracts students whose attitude is more emotional than intellectual. Here we find a rare instance of field dependence connected with nonconformistic activities.

Strategies in categorising information were also studied: the width of categories used and the nature of categories applied. To study category width Pettigrew's scale was used. The expected broader category width in the art groups and the males was in some degree confirmed by positive loadings of the Pettigrew scale on the art and sex dimensions.

Both the inhibition of impulsivity and the style of risk-taking ("calculated risk") can be seen as an aspect of ego-development. To assess risk-taking behaviour and impulsivity, a questionnaire, a chance-preference task, an information-sampling task and a task requiring drawing lines slowly were used, in all groups except the Free Academy group. The chance-preference task and one of the draw-a-line tasks ("as slow by as possible" condition) represented mainly sex differences. The information sampling task and the other draw-a-line task ("slow" condition) however, separated the control groups. The teachers' college students showed a controlled style of working here, taking ample time for the task, while the female chemical technicians

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adhered to an impulsive style. The involvement over time was considered as the most important variable. A short period of involvement in the task was interpreted as a defensive reaction based on insecurity. The questionnaire results supported the description of the teachers' college students as conscientiously planning and working.

Students were asked to write their autobiography. Art students and non-art students differed significantly on a number of content categories, the art students showing more self-reflection, more affinity to politics, religion, psychology or philosophy, more psychological problems, more non-conformism and a more negative relation with parents. The students of the Free Academy expressed much more psychological problems than the students of the Royal Academy.

Conclusions

From the results of the autobiographies and the cognitive tasks emerges an image of the particular way in which each group develops its own style of life. That of the teachers' college students is characterised by verbal ability, for the males in combination with creativity and some conflict with the environment, for the females in connection with diligence, control, a long time perspective and happy childhood memories. In the technical groups all students are concerned with non-human matter in their study. For the males this is related to competence in abstract thinking both in verbal and in non-verbal areas, and to an open, adventurous attitude towards experience, whereas for the females their choice of a - relatively short - technical training is related to a rather defensive, constricted, non-expressive attitude towards reality and a short time span. This typically represents a choice of a life-style, for intellectually their capacities are on the same level as those of other female students.

The choice of an artistic commitment can be described as follows. Already at an early age talent is often visible. This elicits reinforcing attention from the environment, which in turn heightens the involvement in artistic activities and helps to shape a concept of the self as "creative".

Experiencing the self as creative does however not produce the euphoria one would expect, but rather gives rise to feelings of being different, isolated and lonely. The cognitive structure of the artistically inclined person might play an important role in this feeling of not fitting into the system. The results of the cognitive tasks confirm that primary and secondary thought processes are intertwined in artistically gifted persons, leading to strong influences of emotions on thought. Using the concept of permeability one can say that the ego-boundaries of the artistic person are very permeable, which in others might cause feelings

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of anxiety and being threatened, who in their reactions to creative abilities are often so ambivalent: admiring the talent, but disapproving of the emotionality.

The resulting isolation itself might act as a stimulus to engage further in fantasy and imagination, and to choose a style of life which involves a heightened search for communication with congenial spirits, for understanding and expanding one's own psychic experiences, for adherence to broader systems of social-political, philosophical or religious thought and also to a permanent friction with those orderly forms of organisation which resist change and individuality.

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