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## SUMMARY

### THE EDUCATIONAL TECHNOLOGICAL PREPARATION OF TRANSVAAL STUDENT TEACHERS

#### 1. AIM

The aim of this study is to ascertain to what extent student teachers of Transvaal universities and colleges of education are technologically prepared for their teaching profession. Relevant aspects of teacher training with special reference to the Transvaal were attended to. The importance of this undertaking is partly due to the fact that the modern school is compelled to make greater use of technological aids to prepare the child optimally for the complex world of the future. Some general implications based on the findings of this study are pointed out.

#### 2. METHOD

A study was made of available literature on educational technology. Attention was also given to the historical development of educational aids, present practices of teacher training overseas and in the Republic of South Africa and the compilation of criteria for the training of European student teachers in Transvaal.

Additional information about the present practice in Transvaal was gained by visits to the four universities and the four teacher training colleges, interviews with lecturers responsible for audiovisual training and questionnaires to student teachers in their final year.

### 3. FINDINGS

#### 3.1 Problems experienced by the modern school and attempts to overcome these

The task of the modern school is complicated by the great expansion of knowledge, the rapid increase in the pupil population, problems of financing and a shortage of teachers.

Curriculum reform, differentiation, psychological approach in education and new approaches such as the systems approach, programmed teaching and improved methodology are a few attempts to overcome the abovementioned problems.

The value of method and techniques is best illustrated by a discussion of the Montessori-method, the Winnetkaplan, the Dalton-plan, the Morrison-method, team-teaching, schools of the air and teaching by means of television. In addition attention is given to improved teacher training and guidance, as well as the recruitment of sufficient teachers.

In recent years technology and technological innovation, in the form of improved communication media, improved ways of manufacturing, visits to space, etc., has had an increasing influence on society. The new communication media are considered as possible means of solving some of the problems experienced by the modern school. Auditive and visual media can possibly be used to quicken learning and promote understanding.

In the modern school we use child-centered education with full consideration of pupil ability and developmental stage.

### 3.2 The development of education technology and the present state of affairs

A brief summary of the historical development of technology of education as a relatively recent field of study is given.

Early founders of educational technology are the Sophists, Abelard and Comenius, followed by Pestalozzi, Froebel and Herbart. After 1900 Thorndike, Dewey, Montessori, Burke and Lewin played an important part in the founding of the modern educational technology. The empirical approach of children, analysis of learning matter, individualized instruction, progress according to ability, scientific planning of education, better teacher training, thorough educational research, differentiated educational techniques and method, improved communication and the implementation of new educational aids are some of the characteristics of present instructional technology.

To elucidate the present state of affairs in the RSA, a brief summary of recent developments in the USA, Britain, Netherlands, Western Germany, USSR, France and Rhodesia was given. Modern instructional technology, based on scientific teaching theory and method, developed after the Second World War. It is characterized by the use of auditive and visual media according to modern instructional techniques such as programmed instruction, mastery learning, and others aimed at giving each child the opportunity of progressing according to ability. To achieve this aim, continued attention is given to innovation of the curricula, improved teacher training, in-service training of teachers and the application of modern technology in all the abovementioned countries.

Major problems experienced by educationalists are the lack of knowledge among teachers and others about innovatory measures, a lack of materials, the fact that pupils do not respond to new techniques and the lack of knowledge concerning new techniques among teachers as well as an unwillingness to experiment with or to implement the new.

Conservatism can possibly be eliminated by defining educational aims clearly, by introducing new techniques in a well-defined way, by adapting teacher training in accordance with new media and techniques, and by encouraging teachers to make use of these in their teaching practice.

### 3.3 Principles and requirements for the choice and use of audiovisual aids.

The increased use of audiovisual media to overcome some of the problems experienced by the modern school, is sometimes called the technological teaching revolution.

In view of the above it is essential for teachers to take note of the psychological principles of learning and especially the way in which man gains experience by means of perception, how learning matter is retained and how it is recalled. The pre-school phase, primary school phase, secondary school phase and tertiary phase were discussed to point out how the child should make use of direct experience - initially to acquire and accumulate knowledge which will make abstract thought possible.

In his cognitive approach to media usage Salomon refers to the interaction between media, message, educational task and learner

as factors which facilitate the effectiveness of instruction.

According to didactic principles, teaching aids can be classified in an ascending sequence from direct experience to the spoken or written word as the most abstract.

According to communication principles, events in the classroom can be described as psychological interaction between a teacher and a group of pupils. To facilitate efficient communication it is essential that communication media with which the child is familiar, are used in school.

### 3.4 Audiovisual aids must comply with the following criteria

The choice of media is affected by criteria such as project variables which include educational aims, availability of time, the number of learners, the cost-effectiveness ratio, reliability and durability; psychological variables such as the senses, sensory limits and the Hernandez-Peon effect; and learner variables such as ability and interest, media experience and preference. In addition the following criteria must also be considered: integrateability, curricular enforceability, manageability, versatility, the ability to stimulate imagination, the ability to motivate pupils, the ability to encourage individualization and selfactivity, it must improve communication, create balance, must encourage efficiency, must be economic and must facilitate experience.

### 3.5 Audiovisual media in the didactic educational situation

Attention was given to a classification of media. This was followed by a discussion of media characteristics, requirements for

media usage and advantages and limitations of media usage. Lastly an integrated media approach was briefly described.

### 3.6 Training of teachers for the use of audiovisual media and educational technology

It is a too formidable task to give a detailed description of the present state of affairs in all countries as far as this subject is concerned. Some of the most relevant, such as the USA, UK, Netherlands, USSR, France and Rhodesia were discussed.

Certain universities and teacher training colleges in the USA provide excellent training facilities and programs for the use of audiovisual media and educational technology.

In Western European countries such as the United Kingdom, Netherlands, France and Western Germany, audiovisual aids and educational technology form integral parts of the education systems. The training of student teachers, in-service training of teachers, introduction of new media and materials, and the production of software are well attended to.

Modern techniques and methods, educational aids and educational technology are emphasized in the training of student teachers and the in-service training of teachers in the USSR.

Audiovisual media are used according to technological principles in Rhodesian teacher training. By means of in-service training, teachers in Rhodesian schools are encouraged to make the best possible use of modern educational technology.

In the RSA the provinces were discussed separately. It is encouraging to find that educational technology has been accepted throughout the country. In the training courses at the various universities and teacher training colleges in all provinces, thorough attention is given to audiovisual aids in the educational technological program. By in-service training teachers become acquainted with and are encouraged to make use of audiovisual media and technological principles in the schools. Attention is also given to production of software.

### 3.7 Criteria for the training of teachers in the use of audiovisual aids

In view of differences in the training courses in audiovisual media and educational technology at the different universities and teacher training colleges in Transvaal, the following criteria for the training of teachers, were compiled:

- (i) An intensive knowledge of educational technology is required;
- (ii) a would-be-teacher should have a thorough knowledge of audiovisual media;
- (iii) he should know possible uses and shortcomings of the various media;
- (iv) he should know which media can be used in combination;
- (v) the training course should not be too theoretical;
- (vi) the lecturer should set an example in the use of media;
- (vii) too much technical knowledge should not be included in the course;
- (viii) audiovisual education should be an integral part of subject methodology;

- (ix) greater co-operation between media centres and subject methodology should be encouraged;
- (x) training in the production of audiovisual materials (software) is essential.

#### 4. SUMMARY OF THE PRESENT STATE OF AFFAIRS IN TRANSVAAL

A thorough empirical investigation with regard to educational technology in Transvaal followed.

In conclusion the teacher training is tested according to the abovementioned criteria.

##### 4.1 Integration of modern technological principles

It became evident that not all students were properly trained in principles underlying the use of audiovisual media, as some lecturers stated that students were not properly trained in technology. As far as theoretical principles are concerned there are vast differences between the different institutions.

Certain universities and colleges emphasize technological training while very little attention is given to training in the practical use of the various media.

Micro-teaching and television are used by some institutions only.

##### 4.2 A thorough knowledge of audiovisual media is essential

It seems that some students did not have the opportunity of handling certain apparatus. This is due to the fact that some of the universities and colleges do not have the amenities or

sufficient apparatus to facilitate practical experience. Some students however received help from teachers at the schools where they were placed for practice teaching.

#### 4.3 Student teachers should be acquainted with possibilities and limitations of audiovisual aids

Lecturers do not set the example of possible uses of audiovisual aids in their lectures. Students feel that practical use can only be achieved if uses of these aids can be demonstrated in a practical situation.

#### 4.4 The use of media in combination should be emphasized

In some cases syllabuses do not facilitate the proper instruction of the use of media in combination such as a slide-sound combination or the language laboratory.

#### 4.5 The course should not be too theoretical

Enough time should be allocated for the practical handling of apparatus and materials. Because of large classes it is not always possible (classes of 49 to 180 students).

#### 4.6 Lecturers should set an example to the student

This is not always the case, because some lecturers are not fully acquainted with the use of media themselves. Motivation and preparation in the use of audiovisual aids and materials are essential.

4.7 Some syllabuses include unnecessary technical knowledge about apparatus or a detailed discussion on electricity, its origin, direct current, alternating current, etc., which is quite unnecessary. If a less detailed description of apparatus or unnecessary subject matter is excluded, more time can be allotted to practical work.

4.8 Audiovisual training should form an integral part of subject methodology

In audiovisual training the student should be taught how to handle apparatus while the application could be taught in the specialising subject or subject methodology.

4.9 Greater co-operation between media centres and subject methodology is required

This can facilitate advancement of technological principles.

4.10 Training in the production of audiovisual materials

Although this is encouraged by the majority of universities and colleges, some students stated that they did not have the opportunity of producing audiovisual materials. Opportunity for the production of transparencies, photostats, slides, tape-recordings and transcription are essential.

4.11 A uniform syllabus for educational technology for all teacher training in Transvaal is essential. A syllabus committee consisting of representatives of the four universities and the four teacher training colleges should be formed.