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Opening address [to the National Conference on Teaching Machines and Programmed Instruction]

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OPENING ADDRESS

By

PROFESSOR C. B. LINDER

Rector of the Johannesburg College of Education

THE JOHANNESBURG COLLEGE OF EDUCATION is proud of the part it has played in the organisation of this conference. It is grateful to those who will be contributing to its success. It is this College that has taken the initiative in acquainting itself with Teaching Machines and Programmed Instruction and in introducing to the public this new, revolutionary and exciting development in education. In 1962, an article on the subject first appeared in the College publication, *Symposium* and at the end of the year three of its lecturers, Messrs. Barnett, Proctor and Rose, went to England to make a close study of these machines.

This is an historic and unique occasion in the field of education in South Africa, firstly, because this is the first time that the subject of teaching machines is to be discussed at a conference in this country; secondly, because the organisers have succeeded in bringing out to South Africa a group of very eminent and distinguished specialists from overseas; and thirdly—and this is also significant—they are able to count among those present a large number of interested and influential delegates from all parts of the Republic, from Rhodesia and from South West Africa, delegates from commerce, industry, mining, the academic world of the university—the schools, the colleges of education and the military gymnasium. Among those present are several professors, three official delegates from the Transvaal Education Department, three from the Department of Education, Arts and Science and two members of the National Advisory Council of Education.

The organisers have on display some eight or nine different types of teaching machines and a number of books on their application to education. *Automation in Education* written by Messrs. Barnett and Proctor, two lecturers of the College, is one of these books, the first of its kind to be published in South Africa on the subject. These two lecturers are the gentlemen who have worked so hard behind the scenes to make this conference possible, and I should like, therefore, on behalf of all of those present to pay tribute to them for what they have done. It was their enthusiasm and untiring efforts that brought forth the spontaneous support and financial aid that have made this conference possible. In this connection, I must acknowledge with gratitude the assistance that this conference has had from the Sir Ernest Oppenheimer Trust and also the support it has received from the South African Association for the Advancement of Science, whose president, Dr. Biesheuvel, will lead the discussion group on another day.

The organisers have honoured me by asking me to deliver this opening address. I, in turn, must pay tribute to them for the pioneering work they have done in this field of education at our College. An institution such as ours is always concerned with making teaching in the schools and educational methods in general more acceptable, more attractive, if you like, to all concerned. An ever-growing store of knowledge in a world that is becoming increasingly complex requires our children and our students to master more and yet more material in a time-span that does not lengthen, that cannot be lengthened without serious social and economic consequences; and it is because of this that we, the educators, must bear the responsibility of devising the most successful and fruitful methods of instruction in order that, as John Dewey put it: "We may put every child in complete possession of all his powers". With the great shortage of manpower in South Africa, we cannot afford to lose the strength, the talents, the contribution of a single person. Everywhere there is the cry that as many children as possible should try to reach at least matriculation standard in their education. Yet everywhere students fall by the wayside. Failure or retardation, whether it is at school, at college or at university, is public enemy No. 1 of education. In self-defence, we teachers often glibly blame the child or the student or his I.Q. Teaching, no matter at what level, has come to be regarded by some people as a process of selecting those who can from those who can't. The word "fail" should become the four-letter dirty word in education.

It is clear that we have reached a state of crisis in education. People have begun to ask whether, instead of selecting, streaming, skimming students, we should not be selecting better methods that will fit the system to the pupil rather than those that fit the pupil to the system.

Although the relevance of the three A's—age, aptitude and ability—is readily admitted, people are beginning to doubt their absolute validity. This doubting attitude has already brought about a change of outlook, for example, in the teaching of reading. Instead of waiting for the child to reach the age of readiness for reading, we have now to prepare him to be ready for reading. We don't wait, we start preparing the child. Can we not similarly develop and increase a child's ability or his aptitude generally? When a child cannot understand an explanation or a concept, should we not consider that it is not so much, or entirely his I.Q., but at least his training that is to blame? Is programmed instruction the answer? Will it, or the teaching machine, yield a better way of teaching, and therefore of learning the subject matter to be understood? If this is so, then we shall reached a turning point in educational theory and practice.

The arrival of the teaching machine might herald the arrival of modern applied science at the door of education. Science has benefited industry, mining, defence, medicine, engineering. Why should we the educationalists be afraid of opening our doors to its great presence? It is not likely that teachers or parents or the public at large will readily accept this attempt by a machine to intrude into the classroom. The story is told that the invention of the sewing machine was beset with fewer difficulties than was its introduction into the homes of England. Even the medical profession that now acknowledges the efficiency of machines like the iron lung was once wary of anything new.

The greatest benefit of the teaching machine lies not so much in its so-called "hardware" value, as in the programmed instruction that accompanies it and which it makes available. The purpose of this conference is clearly to find out and learn more about these programmes, to study the different types such as the linear programmes of Skinner and the branching programmes of Crowder, to grasp the underlying principles and realise the possibilities, the difficulties, the limitations of a new method, but also, I am sure, to assess the success that awaits the teacher in his acceptance of it. To the education authorities of the Republic, this conference may prove to be of utmost significance for we have only to consider the crucial need of the vast non-White population; hundreds of thousands still require to be taught to read and to write and to be trained in simple computational skills. Then there are the new practices to be taught in agriculture, in health and home management. New industries must be manned, as well as new public works; machinery must be understood and operated. Where are we going to get the teachers? How long is it going to take to get the teachers? Perhaps in the expertly planned programme we have a device for supplying us with what we might call sufficient mechanical teachers and a means of self-education. We know only too well of countless overcrowded one-roomed schools in the charge of teachers who themselves are poorly equipped. Just think, therefore, what could be achieved in these schools with a small library of expertly-constructed programmes. Maybe the conference could find the time to discuss this important aspect of education.

I am particularly pleased that the language laboratory is also featured on the conference programme. Much might be done in such a laboratory for the teaching of the second language. The teaching of the second language is probably in many ways the foremost task of the schools of South Africa. From what we have already seen of the language laboratory, the Johannesburg College of Education is very keen to have one of its own. The Transvaal Education Department has accepted, in principle, the need for establishing such laboratories at Colleges of Education because of the acute shortage of English-speaking teachers. The first task at our college in Johannesburg has been to train English-speaking teachers for English-medium schools. However, it is obvious that it should also be our responsibility to train English-speaking teachers for the teaching of the English language to Afrikaans-speaking pupils at Afrikaans-medium schools. At present, English is being taught almost exclusively by Afrikaans teachers to Afrikaans pupils. They are doing it very well and very conscientiously, but surely the ideal is for English to be taught by English-speaking teachers to Afrikaans pupils. The hard fact is, however, that we do not have enough English-speaking teachers for the English-speaking schools, let alone for the teaching of English in the Afrikaans-speaking schools. And this is where I hope, that the language laboratory will complement the work of the Afrikaans-speaking teacher. By means of tape-recorders, the Afrikaans pupils, even in outlying districts will be able to hear English spoken by English teachers.

On Friday last, I was a privileged guest at the opening of the Nuclear Physics Research Unit and Accelerator at the University. I did not understand much of all I saw, but two things, I think, I did understand. One was that the unit cost an enormous amount of money, (and I believe the University was only able to acquire it through the generosity of the Chamber of Mines and the De Beer's Diamond industry). The second was that if a certain substance is subjected to an

enormously powerful force, this plain, simple substance releases from itself infinitely greater and more powerful forces. It made me think. There is more in the human mind than we, the educationists have ever dreamed of, more than we have ever got out of it in all our years as teachers. The Americans say: "Give us enough money and we'll put a man on the moon". We educationists say: "Give us enough money so that we may, without restriction, make use of science and the machine, and you will be surprised at what will be unlocked". Truly, we are confronted by revolutionary changes in education. It is my sincere wish that this conference may reap the benefit and success that it deserves: I have much pleasure in declaring this conference open.

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