

# The University of the Western Cape: New Directions, in New Ways . . . for New Times

*A J L Sinclair*

## INTRODUCTION

Ultimate success in any undertaking is largely dependent on the process by which alternative courses of action are identified, their probable outcomes assessed, and the best way of achieving the aims determined. In short, success depends on sound planning. Abraham Lincoln very aptly described the conditions necessary for sound planning when he said: "If we could first know where we are and whither we are tending, we could then better judge what to do and how to do it."

The message in the present paper is the outcome of the academic planning to which the Vice-Rector has referred. This academic planning is closely related, as it turns out, to the HSRC Report on "Provision of Education in the RSA", or the De Lange Report as it became popularly known, which was recently released. In describing our own initiatives, I shall therefore also point out how they are substantiated by the findings and recommendations of that Report.

## THE ADULT EDUCATION GAP — NOT IN OUR STARS . . .

The term "adult education" or "the shadowy other system of education" as it has been called, has an unfortunate connotation. It has for too long been associated primarily with voluntary and non-professional education and has as a consequence remained separate from the educational mainstream. Professor Ross Waller pointed out nearly three decades ago that: "Universities having lodged their extra-mural responsibilities with special departments, have been the better able to forget them." The HSRC Report, by placing non-formal education, which is aimed at the adult, at the same level as formal education, has given a new direction and directive to South African universities. It also stresses that "The adequacy of the planned provision of education in a modern society cannot be measured only in terms of formal provision but should also be evaluated on the basis of both formal and non-formal provision . . . In several memoranda and in research stress has been laid on the special importance of the contribution that non-formal education should make, particularly with regard to manpower needs."

Another unfortunate connotation that the term "adult education" has acquired, is that of literacy programmes

alone. Again the HSRC Report puts the matter in perspective by distinguishing non-formal educational programmes at three different levels, ranging from literacy programmes at the first level to advanced occupational programmes at the third level. We should realize that the teacher who qualified ten years ago and who has not had any form of in-service training since then, has almost as much of a gap in his educational skills as the early school leaver who lacks the basic academic skills.

We must remember, however, that the history of non-formal education reveals that the many bold words about the matter have seldom been matched by equally bold deeds.

As early as 1850, at Oxford University of all places, Sewell suggested the extension of university teaching to give working people the opportunity of higher education by asking: "Though it may be impossible to bring the masses requiring education to the university, may it not be possible to carry the university to them? . . . By originating such a comprehensive scheme the universities would become, as they might be, the great centres and springs of education throughout the nation at large." And yet as recently as 1972 the Report of the Review Body appointed by the Council of the University of Birmingham stated: "The University should endeavour to apply its specialised knowledge and its application in society to institutes, industry and individuals through its adult education and extension services by making such educational provision as may be necessary and practicable for those who might benefit from such specialised knowledge." This shows clearly how impervious educational institutions can be to change — much the same as Gulliver to the arrows of the Lilliputians.

One evident reason for the relatively unsatisfactory progress of non-formal education lies at management level. Whereas formal education can be easily defined and described, non-formal educational activities defy simple description, let alone simplified planning. The degree of cynicism with which efforts at adult education have been treated is apparent from the following description by Coombs: "Few nations have even a moderately good inventory of their present activities in this realm, much less an assessment of future needs and how best to meet them . . . The aims of these activities are often unclear, their clientele undefined, and responsibility for their management and funding scattered across dozens of

public and private agencies. They spring up spontaneously, come and go, at times succeed brilliantly but just as often die unnoticed and unmourned. Nobody in particular is in charge of monitoring them, of keeping their evolving pattern in overall perspective, of identifying gaps that need filling and projecting future requirements, or of suggesting priorities and better ways of harmonizing them and boosting their efficiency and effectiveness."

And despite all the foregoing cynicism it has to be conceded that the existing gap in adult education can only be reduced by implementing educational strategies which will reach out to the potential learner and enable him to equip himself with the skills his work situation demands — skills which entail the acquisition of knowledge for **use** rather than for **possession**. This is still the most cost-effective form of education. But such an adult outreach plan, we must remember, will only affect the existing education gap. It is the future shortfall which must be intercepted — and that can only possibly happen if we are prepared to look critically at the formal education system.

The desperate shortage of professionally qualified teachers, which is 66 and 85 per cent respectively in the case of Coloureds and Blacks — and particularly high in such subject fields as mathematics and the sciences — emphasizes the adult education gap in the teaching profession and puts traditional quality teaching out of the question. Until such time as there are more qualified teachers, and I mean this not only in the formal sense, other strategies will have to be implemented to prevent the adult education gap from growing even wider. One way of preventing this is to give the pupil at school access to decent instructional material.

If the majority of teachers in the Coloured and Black schools are underqualified, the most urgent need is not only to get them formally qualified — which is a time-consuming process — but to raise their efficiency, i.e. to extend their subject knowledge and the teaching skills for which they should receive formal recognition. In the words of the HSRC Report: "Teachers should have sufficient knowledge and understanding of their subjects to present them with enthusiasm and confidence."

Existing in-service training, when and where available, can hardly make any impact in this regard. What is needed is individualized, continuing in-service training which will not draw the teacher, or any other adult for that matter, away from the job for any length of time.

On entering university, the first-year student from an academically deprived school (and possibly home) milieu has accumulated such a backlog that his chances of finishing a course in the prescribed time are minimal — if he will finish it at all. An example from our campus will suffice: Of the 914 science students who began degree work at UWC during the period 1965-76, only 154 students (17 per cent) had completed bachelors' degrees by 1980. Of these, only 48 students (5 per cent) finished

their studies in the three years prescribed for the degree. The remaining students completed their work through extended programmes of four years (6 per cent), five years (3 per cent), six years (2 per cent), and seven years (1 per cent).

These figures must be interpreted against the fact that the largest single category of UWC students, viz. 42 per cent, passed the school leaving certificate with only a D symbol (50 - 59 per cent).

If we take into consideration the fact that more than 40 per cent of the White students who passed their matric in the first class turn out to be unsuccessful at university, the real need for bridging material and an altogether different teaching-learning arrangement than that presently in existence at the predominantly White universities seems incumbent on campuses like ours.

The waste in human and educational resources represented by the above figures is appalling. This must also be seen in conjunction with the high drop-out rate of school children: Of the pupils who started school in 1963 and who then completed thirteen years of schooling, the percentages for Whites, Indians, Coloureds and Blacks are respectively 85,40%; 22,30%; 4,40%; 1,96%. The drop-out child of today is the adult in need of compensatory education tomorrow, something which he is hardly likely to attain through formal education. And even if he does, it may not be very relevant to what his work demands. The inevitable conclusion is that adult education must not be regarded as a luxury for a few exceptional persons here and there, nor as a thing which concerns only a short span of early manhood, but that it is a permanent national necessity, an inseparable aspect of citizenship, and that it should therefore be both universal and lifelong.

In this way education does not become primarily a selective/rejective system, but a resource available to all.

## CHANGE BY DESIGN... NOT BY DEFAULT

After what has been said, it should be apparent that UWC fully realizes that the successful application of any form of non-formal education requires more than the mere addition of an adult education component to formal education. It must coincide with radical changes to the very structure of the existing basic education system, shifting the well-defined boundaries of formal education to the less well defined boundaries of life itself.

The leadership UWC has taken nationally and internationally in its implementation and integration of computer-based education sprang from a systems approach which revealed various shortfalls in its academic milieu. This coincided with a redefinition of the University's role, with a more balanced emphasis on formal and non-formal education. By developing a five year computer-based outreach programme, UWC has committed itself unequivocally to reaching out to the community at large, thereby allowing it access to tertiary level studies.

All the above form part of the strategic planning that this university is so heavily involved in. It implies a vast and complex modus operandi, including survey research, attitudinal studies, awareness and involvement programmes, long-range forecasting, scenario generation and simulation, diagnosis of trends, formulation of effective measures, and continuous feedback. In the past universities throughout the world have been accused of unbusinesslike management and told in so many words that if they could run their households in a more businesslike way, most of their educational problems would vanish. UWC is in the process of moving away from a static tried-and-true approach to an organic adaptive orientation. The University has reached the stage where its long-term perspective and long-range planning is documented in various action programmes, of which the computer-based outreach programme is but one.

In our strategic planning, we have become much more customer- or market-oriented, in the full realization that it is no longer enough to be production- or research-oriented. In short: We have taken sound business principles and adapted them to our planning strategies. We feel strongly that in the years ahead the universities are going to have to relate their products to a buyer's market as opposed to a seller's market. In fact, one wonders, when paging through the HSRC Report, to what extent the educational hierarchies have in the past identified their particular consumer public and its needs.

### **UWC AND COMPUTER-BASED EDUCATION — SENSING THE EDUCATIONAL DRIFT**

One of the recommendations of the HSRC Report is "that immediate attention be given to the introduction of the computer in education" and that action research centres be established. The Report also concedes that some educational problems can only be solved by the introduction of educational technology.

Since we were the first South African institution to implement computer-based education, we have had to rely heavily on qualitative techniques of assessing the available system in the absence of appropriate historical data. We had to consider the sophistication and cost-effectiveness of the system, the supplier's involvement in the educational field, and the quality of the library within our specific context.

This university has committed itself fully to instructional computing on and off campus. At present the 64 terminals serve an on-campus population only; from its inception, however, the UWC system was designed to answer the educational needs of a broader community. Since the mainframe computer purchased by UWC to support its instructional computing programme is quite capable of more than doubling its present load of terminals, it is eminently suited to any outreach project.

We also fully realized from the very beginning, however, that any form of educational technology, especially

where highly sophisticated equipment is involved, is only effective if it is sensibly integrated into an operational context. The necessary infrastructure was therefore created in the UWC Teaching Centre, which is the hub of academic planning and research at the University.

Our immediate future planning now involves the development and implementation of instructional material and procedures to serve four basic population groups:

- \* students currently enrolled in secondary schools
- \* adults requiring instruction to compensate for inadequate secondary school education
- \* students who have entered university with educational shortcomings
- \* secondary school teachers who need to refresh or upgrade their subject knowledge or pedagogical skills.

The role of computer-based education in helping the University deliver improved educational opportunities to these four groups has been structured into a five-year plan, involving four projects in educational computing:

- \* A Mathematics/Science Matriculation Outreach Project (July 1982 - December 1986)
- \* An Educational Computing Services Dissemination Project (July 1983 - December 1986)
- \* A Computer-Based Courseware Evaluation/Improvement Project (January 1985 - December 1986)
- \* Afrikaans for Special Purposes Project (Dates to be determined)

These projects are, in truth, four stages of a single outreach education plan. The starting date, training programme, unique staff requirements, and specific objectives which identify each particular stage are part of an overall design.

The following descriptions of the four projects will reflect the chronological order in which they will be implemented. The first project will be reviewed in greater depth since it is central to all the others.

#### **Project 1: Mathematics/Sciences Matriculation Outreach Project**

The first stage of the total outreach plan will involve the UWC computer-based education facility in a curriculum development effort of national import. It is a 54-month programme aimed at the development, validation, and dissemination of bilingual computer-based curricula in mathematics and the sciences. The project will eventually also include material to promote English literacy in the scientific field (for which courseware is at present being developed elsewhere).

The critical need for bridging courses in mathematics and the natural sciences stems mainly from the gap between the limited educational opportunities provided



by the secondary schools, and the mathematical/scientific expectations of business, industry and tertiary education. The HSRC Report points out that these subjects are at risk in formal education. It continues by saying: "It has at the same time been found that an adequate grounding in these subjects is not only of critical importance for the development of the RSA, but that they should be a part of the equipment of every person in the modern world . . . (that) every person in today's world should acquire a minimum of scientific literacy, that some should take the study of these subjects up to an academic, technical or technological level and that the demand for all these is, in terms of the growth directions of our economy, on the increase."

As far as higher education is concerned, the HSRC Report recommends suitable courses in mathematics and the physical sciences as an interim measure to overcome the disparity between secondary school and university.

The UWC project will include the establishment, initially, of four computer-based learning centres within a 50 kilometre radius of the University, each with eight terminals linked to the UWC mainframe computer. Personnel at these centres will be trained in the use of the system by Project staff attached to the Teaching Centre on our campus. The staff thus trained will in turn use the bridging courseware to instruct adults and secondary school students in the community. The monitoring of course development activities, the provision of consultant services to the personnel of the four outreach centres, the training of outreach centre personnel, the implementation of the use of the bridging courses, and the evaluation of the programme will be the responsibility of the UWC Project staff.

### **Six Components of the Project**

The Mathematics/Sciences Outreach Project may be described in terms of six separate components:

#### *Component 1 -*

#### **Identification of specific areas of deficiency in the mathematical/scientific education of first-year university students**

Computer-based testing units, based on the syllabuses for Standards 7 - 10 in mathematics and the sciences, are now being developed to complement the existing courseware for mathematics and the sciences. Pilot use of this material is scheduled for January 1982. The results will be used by UWC staff to begin the identification of specific areas of student difficulty and to begin the search for appropriate material for remedial instruction.

#### *Component 2 -*

#### **Preparation of instructional modules employing the unique characteristics of computer-based education to remedy the deficiencies identified in mathematics and the sciences**

This component concerns two facilities of the UWC computer-based education system: In the first place, the Lesson Library, containing a very exten-

sive range of tested lessons in a variety of subjects directly relevant to the proposed project; in the second place, the system's learning management capability, which continuously monitors every student's progress and makes the results available on-line or in print at the instructor's request. In addition, communication between student and instructor is also possible by means of various forms of note-sending via the computer.

#### *Component 3 -*

#### **Modification of existing lessons and the construction of additional courseware to meet the requirements of the matriculation syllabuses**

Experience over the past twelve months has revealed the need for lesson modification/construction in order to tailor the lesson material to the South African student population. The modification of lessons will be governed by two considerations:

- \* the adaptation of American courseware to meet South African needs
- \* the need for these lessons to be in both English and Afrikaans.

With regard to the first of these considerations, it will be necessary to construct new lessons to fill the gaps in the existing library. For example, the matriculation syllabuses of the RSA include topics which go beyond the mathematical/scientific expectations of the American secondary schools.

The second consideration recognizes the need (1) to adapt the English idiom and cultural references of computerized lessons developed in America to South African requirements, and (2) to make all the courseware available in Afrikaans as well, since at least 67 per cent of the students at UWC have Afrikaans as their mother tongue. By providing instruction in both languages, all our students will be able to study in the language of their preference.

#### *Component 4 -*

#### **The development of personnel to carry out the modification and construction of computer-assisted lessons**

The modification and construction of lessons require three groups of personnel:

- \* skilled subject teachers who are trained in the design of computer-assisted instructional material
- \* assistants who will convert these lessons into computer code
- \* language specialists who will carry out the English/Afrikaans translations.

#### *Component 5 -*

#### **Training of outreach centre staff in the use of educational technology**

This will involve the training of outreach centre staff in computer-based instruction, which will demand

substantial changes in teaching style. Experience with staff members at UWC suggests, however, that teachers will alter their styles spontaneously when they become familiar with the advantages of computer-assisted instruction.

The instruction of outreach centre staff would be mainly accomplished by means of training sessions conducted at these centres by UWC Teaching Centre staff. The outreach centre staff would be taught the best way of using the facility to teach adults and secondary school students.

Each learning centre will be closely monitored in order to secure optimum usage.

#### *Component 6 -*

#### **Implementation of mathematics and science modules amongst university students, secondary school students, and/or adults in the community**

The modules and lessons developed by the Project will be made available to all possible users of the educational computer facility. To serve this end, each outreach centre will be available at hours which will also meet the needs of adult users.

#### **Project 2: Educational Computing Services Dissemination Project**

The goal of this 3½-year project is to increase the local availability of computer-based educational services. This includes not only the placing of terminals in institutions which are convenient to our target populations, but also the development of a cadre of local educational computing consultants with sufficient knowledge of instructional computing to ensure effective use of the system. We aim to attain this goal by setting up dissemination centres (each consisting of 8 terminals with trained personnel) at 24 institutions over the period of the project. Each participating institution would be provided with such an installation without charge for a period of two academic terms (six months). Project personnel from UWC would train members at each such institution to act as consultants for the dissemination centres, after which they would continue to aid each centre's consultants throughout the term of the installation and would help institutions make the necessary arrangements for the establishment of permanent installations when project equipment is withdrawn at the end of the 6-month period.

#### **Project 3: Computer-based Courseware Evaluation/Improvement Project**

This two-year project has two major goals: (a) to validate the computer-based courseware in mathematics and the natural sciences for South African secondary schools, and (b) to produce material, procedures, and a cadre of secondary school teachers which will guide the evaluation and ongoing development of computer-based courseware. In the first of these two goals we recognize

that experienced secondary school teachers must participate in the development of any secondary school curriculum if that curriculum is to be accepted, implemented, and designed to meet the needs of secondary school students. Thus, while tertiary level personnel (university staff and programming assistants) can contribute to the design and encoding of computerized lessons (such as those proposed in the Mathematics/Sciences Matriculation Outreach Project) such new courseware needs to be evaluated by those persons who are engaged in the active teaching of the topics included in the curriculum. To accomplish this, secondary school teachers with educational computing facilities at their disposal for use with their students will be given training in the unique task of evaluating computerized instructional material. In addition to making editorial notes on minor changes, these evaluators will have a chance to identify major conceptual problems in lesson developments and to suggest alternative possibilities in the development of the lesson material. Actual modifications of the programmes will be carried out by special project staff responsible for the final design and programming of the lessons. Moreover, the evaluation techniques and procedures resulting from the review of the curricula in mathematics and the sciences should be applicable not only to the continued development of these subjects, but also to the development of computerized curricula in other subject areas.

#### **Project 4: Afrikaans for Special Purposes**

The experience gained and procedures developed in the course of the three projects outlined so far will in the end be directly applicable to another, a fourth project: a computer-based course in the applications of Afrikaans in business, education, mathematics and the sciences.

Although the majority of our students have Afrikaans as their first language, there are serious shortcomings in their language performance when it comes to tertiary studies — especially in mathematics and the sciences where they reveal a general inability. The student's understanding of concepts is thwarted by his failure to communicate his thoughts.

As far as Afrikaans in the business world is concerned, employers confirm that limited language skills are a significant obstruction to professional advancement. The academic skills of jobseekers simply do not match those required by employers. In this case, moreover, the persons affected have usually terminated their formal education. An alternative to classroom instruction is needed.

While the objectives associated with the use of educational computing in the teaching of Afrikaans are not distinct from those of the first three projects outlined, they are of such complexity as to demand an entire project to themselves. The target groups to be served by the Afrikaans project will of course include the same four groups as the other projects. The Afrikaans project can therefore utilize the educational structures and physical centres already established. In addition, it will also suit the needs of English-speaking professional persons with business or academic involvements in South Africa.

## FOOTING THE BILL: A QUESTION OF QUALITY

The total budget for the three main projects is big, but so is the task. The focus of the combined effort of the three main projects is on the improvement of instruction in mathematics and the sciences in order for South African education to meet the scientific literacy requirements of its present and future manpower needs. In the end the same lesson material will be suitable for secondary school students (to provide improved instruction), secondary school teachers (to improve their instruction and to upgrade or refresh their subject matter backgrounds), and undereducated adults who have reached the end of their formal education but now require the academic skills necessary for advancement in their jobs.

While the University of the Western Cape and participating institutions from the Cape area will be at the centre of this curriculum development activity, there is a need for the products of these projects throughout South Africa. We aim to serve that broader audience. The materials and procedures developed by our projects will eventually become available throughout the country by means of the same delivery system. It is not far-fetched to envisage a network of shared expertise in the near future which will ultimately benefit the widest possible sector of our population.

Of course, existing curricula will always change. In the past, such changes have been implemented by rewriting the syllabuses, which inevitably created a need for new textbooks. If there were errors or weak sections in the revised textbooks, corrections or modifications (if done at all) had to await the publication of a new edition, and instruction consequently became "textbound".

The computer-based curricula which we shall be developing will also need correction and modification to meet the needs of a changing South Africa. In the case of computerized lessons, however, corrections and modifications are not subject to the time delays and reprinting costs of textbooks. By monitoring the file of comments from students and teachers, an author can regularly improve his material. Not only can such comments lead to the speedy correction of errors, but they also provide the feedback which is so necessary for the validation of the contents. Poor lessons can be deleted and new lessons added as required. The result is a continuously updated curriculum which is responsive to the changing educational needs of society.

The project and, consequently, the financial considerations reflect the effort to provide the time and manpower needed to develop an educational product of national consequence. While something could indeed be produced with less testing by fewer qualified personnel, and in less time, it was decided that half a loaf, in this case, would not be better than none. Unless the development of this significant effort can be done properly, it should not be done at all. A poor product at half the cost cannot be considered as anything but a total waste of money and time at a juncture when both are in short supply.

## LOOKING AHEAD

For the next few years, the development of instructional computing at the University of the Western Cape will call for the support of international consultants. However, there are two notable conditions which guide the need for such outside help. First, the experts will be selected to help us get where we wish to go **rather than to tell us where we should be going**. The proposals associated with this five-year plan define a clear goal: consultants are but the means of attaining it. Secondly, it is our intention that, in so far as possible, each invited consultant should undergo "academic cloning". To this end, each of these consultants will be paired with a South African project member. That member will have to be prepared to assume the international consultant's role by the time the consultant leaves the project.

With this kind of outside help South Africa will be in the best possible position to develop its own contingent of experts in the shortest possible period of time. As it is, the University of the Western Cape has already established one of the finest educational computing facilities in the world, with a growing body of specialists consisting of committed lecturing and administrative staff.

## IN CONCLUSION

The University's proposed five-year plan turns out to be directly in line with the major issues raised by the HSRC Report. The UWC's plan to employ technology in the form of computer-based education will specifically address the following national issues:

- \* It proposes the development of a technological medium which responds to the educational needs of the individual learner.
- \* It directs its initial focus upon the improvement of the materials and teaching staff in the "scarce subjects" of mathematics and the sciences.
- \* It includes awareness and training programmes aimed at creating hundreds of informed teachers with positive attitudes towards the use of educational technology.
- \* It extends the opportunity for remedial and continuing education beyond the restrictions of school classrooms and school hours.
- \* It incorporates a research component which will provide continuous guidance to the development and evaluation of its implementation.
- \* It permits curricular development specifically tailored to the needs of South Africa as defined by her citizens.

The HSRC Report has emphatically stressed the responsibility of both the public and the private sector in helping to solve the educational challenge facing this country. The UWC has taken on this challenge with every resource at its disposal, but we cannot do it alone. We need your help.