

**UNIVERSITY PREPARATION PROGRAMME  
PHASE II MIDTERM EVALUATION REPORT:**

**FINDINGS FROM SEPTEMBER VISIT TO SOUTH AFRICA  
TO INTRODUCE TRAINING AND EVALUATE MATERIALS**

**OCTOBER, 1982**



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424 F Street/San Diego, California 92101

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## TABLE OF CONTENTS

	Page
I. BACKGROUND	1
II. PURPOSE	3
III. METHOD	5
A. Training Workshops	5
B. Interviews with South African Educators	6
IV. RESULTS	8
A. Evaluation of the Training Workshops	8
B. Evaluation of Study Guides	13
C. Evaluation of Concept Development Worksheets	18
D. Results from Special Meetings	23
V. CONCLUSIONS	32
VI. A FINAL NOTE	33

## I. BACKGROUND

The University Preparation Programme (UPP) is an in-country program effort to help South African students and others prepare for the South African matriculation examination<sup>1</sup>. The matric exam is the high school leaving test in South Africa and is prerequisite to university entrance. Matric is also a requirement for teachers in South African schools. Although most teachers in black South African schools have not passed the matriculation exam, a new law now requires all teachers to pass matric in the future.

The UPP is a logical outgrowth of a series of programs sponsored by the United States Agency for International Development (AID) in cooperation with the United States Information Service (USIS) (formerly USICA). In 1979, an American team from the University of California, San Diego, presented a three-day seminar at the University of the Witwatersrand followed by a series of individual visits to various universities around the country. The subject of the seminar series was the United States' experience with affirmative action in higher education. The team consisted of Mr. David Ryer, Assistant Chancellor; Mr. W.A.T. Byrd, Director of Educational Opportunity Programs; and Dr. Kenneth Majer, Director of the Office of Academic Support and Instructional Services.

This activity was extended in 1980 to include a series of in-country seminars on the development of academic support programs in black and open universities in South Africa. Dr. Larry Hedges from the University of Chicago joined the team at that time.

Subsequently, Majer and Hedges were asked to work with the South African community to attack more directly problems of black students who aspired to university work in South Africa. With clear direction from South African educational leaders, both black and white, the UPP was designed as a logical extension of the work that had been completed in 1979-80. It was designed as an experiment to test the viability of assisting educational programs

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<sup>1</sup> The UPP focuses on the Joint Matriculation Board Examination (JMB), which is the highest level exam. However, since students who are prepared for the JMB would also be prepared for any of the provincial exams, the general reference to matric rather than JMB matric will be made throughout this report. This reference is to ensure the understanding that no one among the South African student community in question is excluded from the program.

conducted by non-South African Government institutions, using United States Government funds directed through private U.S. companies. Because of its origin, the UPP is sometimes referred to as "The San Diego Project."

The UPP pilot project was designed in two phases, with ample opportunities for evaluating the program during each phase to determine the efficacy of developing a joint United States - South African community project in the politically volatile South African situation. Numerous adjustments have been made to accommodate the many new developments that have been uncovered during the initial stages of this pilot effort (see Phase I quarterly reports).

#### A. Phase I

Program and training materials were designed during the first phase of the project. It was designed as an 18-24 month phase and ended in early 1982. During this time, a training manual was developed and 50 UPP Study Guides in mathematics, English, and physical sciences were completed. These materials were designed to be used in a tutorial context and were developed based upon a comprehensive analysis of the previous ten years of South African matric examinations. Finally, a field test of the training materials was conducted in January, 1982.

#### B. Phase II

Phase II is a 10-month testing and evaluation period (July 1982-April 1983). There are three major objectives to the second phase of the pilot effort: (1) develop prototype Concept Development Worksheets in mathematics as requested by the South African community (see Appendix I); (2) conduct pilot Training Workshops in South Africa; and (3) evaluate the status of the project to determine the value of moving ahead from a pilot project to full-scale, countrywide implementation of this effort.

This document is a midterm report on the progress of the UPP toward achievement of the three objectives. The data for this report were gathered during a trip by Drs. Majer and Hedges to South Africa in September, 1982.

## II. PURPOSE

The overall purpose of the September, 1982 trip to South Africa was to provide a detailed introduction to the UPP for potential users of the program and the program materials. Therefore, the introduction was provided through a series of Training Workshops that presented the UPP materials and suggested procedures for using them. These workshops presented the UPP as a "nonformal education programme" that stresses individualized instructional techniques that can be used in nontraditional (outside the schools) or in traditional classroom settings.

"Nonformal education" is a term that is familiar to South Africans. The UPP staff defined it to include individualized instruction that is learner-centered and mastery-oriented. However, these concepts are novel to most South Africans, particularly among the less well-trained black educators. And, because the UPP materials were designed to be used in nonformal settings, training in these techniques of learner-centered instruction was essential to promote the most effective use of these materials.

The five specific aims of the September, 1982 trip to South Africa were to:

1. Introduce the UPP via Training Workshops in non-formal teaching techniques as a specific introduction to the use of UPP materials.
2. Assess the success of the Training Workshops. This assessment was to include the level of interest in both the UPP and its materials. A specific issue here is the usefulness of the workshops as perceived by the participants (tutors, teachers, alternative education personnel).
3. Assess the level of interest in the program. This assessment was to include the perceived need for the program, the perceived value of the program, and the willingness to participate in implementation of the program. A specific issue here is whether the level of interest outside Johannesburg would warrant attempts to implement the program in other areas of the country.
4. Assess the value of the UPP materials as perceived by Training Workshop participants. It is important to note that because informal teaching techniques are so novel in the South African situation, training in these nonformal techniques was essential to permit an informed, professional judgment about the quality of the UPP materials. The materials to be evaluated included the UPP Study Guides

and the new UPP Concept Development Worksheets (CDWs). Specific issues here included whether the Study Guides and CDWs are useful; to whom they are useful (i.e., teachers, students, etc.); and what proportion of students would likely benefit from them. A related issue was whether the CDWs enhance the usefulness of the Study Guides.

5. Determine adjustments to the UPP on the basis of the evaluation data collected. The adjustments were to be determined on the basis of direct feedback via the evaluation forms (see Appendix II), by reflections on those results by CGI, AID, and USIS staff, and through communication with community organization leaders, tutors, educators, and other relevant South Africans. A specific issue here was whether the original community organizations identified to implement the UPP would be able to do so at this time. A further issue was whether other community organizations would be better centers for program implementation.

### III. METHOD

Two different procedures were used to accomplish objectives 1-5 in Section II. First, a total of three Training Workshops were conducted in Johannesburg and Cape Town at the American Cultural Centers, and at the University of Zululand. A second procedure involved interviews with relevant South African educators.

#### A. Training Workshops

Participants were solicited by notifying the five community agencies who originally agreed to participate in the program. Partially because of communication difficulties during the five-month period when the project was without funds, four of the original agencies responded that they could not send participants to the Training Workshops. It was therefore decided by USIS personnel in consultation with CGI to advertize the workshops publicly (in the newspaper). Participants were also solicited directly by USIS personnel in South Africa. Arrangements for the timing and location of the workshops were made by USIS personnel.

Each of the Training Workshops was scheduled to last approximately two days. The workshops were based on five to six chapters of the UPP Training Manual that was developed and field-tested during Phase I of the UPP project. The training involved the history of the project, the development of individualized instruction, modern methods of individualized instruction, instructional objectives, task analysis, questioning techniques, and problem-solving methods. The training was based on an individualized instruction approach with a heavy emphasis on learner participation.

One component of each Training Workshop was an evaluation of UPP materials. Each participant was given a UPP Study Guide and asked for his or her professional evaluation of the Study Guide using Evaluation Form C (see Appendix II). Each individual was also given a draft copy of a CDW and asked for his or her professional evaluation of the CDW using Evaluation Form A (see Appendix II). Approximately one and one-half hours from each workshop were devoted to materials evaluation. At the end of the workshop, participants were also asked to evaluate the entire workshop using Evaluation Form E (see Appendix II).

The participants in each of the Training Workshops are described briefly below:

Johannesburg (United States Cultural Center, September 11-12, 1982). This workshop was attended by 14 teachers and nonformal educators.

University of Zululand (September 14-15, 1982). Forty-one teachers, student teachers, University staff, and one school inspector attended this workshop. Four participants were lecturers at the University of Zululand.

Cape Town (United States Cultural Center, September 17-18, 1982). This workshop was attended by 21 teachers and alternative education school personnel.

#### B. Interviews with South African Educators

In addition to the formal evaluation conducted during the Training Workshops, informal interviews were conducted with a number of South African educators and community leaders in each of the cities on our itinerary. The persons interviewed are listed below by location.

##### Johannesburg

Bernadette Mosala, Educational Opportunities Commission (EOC), South African Council of Churches  
 Barry Mosaga, Director, EOC Alternative Education School, St. Ansgars School  
 Mokgethi Motlhabi, Director, EOC  
 Nic Mogatusi, Teachers' Action Committee (TAC)  
 Motobati, TAC  
 Morepe, TAC  
 Tony, TAC  
 John Samuel, SACHED  
 H.H. Dlemlenze, African Teachers' Association of South Africa (ATASA)  
 Joyce Buku, ATASA  
 Phyllis Lerutoane, ATASA  
 Jennifer Glennie, Independent Consultant to SACHED  
 Stanley Kahn, University of the Witwatersrand

University of Zululand

Professor Vos, Dean of Education  
Dr. Abraham Nkabinde, Rector  
Dr. Piet Styen, Senior Lecturer in Mathematics

Durban

Mr. Garrib, Education Manager, Urban Foundation, Natal  
Region

Port Elizabeth

Mr. Phillip Botha, Director, Continuing Education Center,  
University of Port Elizabeth  
Mr. Winky Ximiya, Director, Career Education Resource  
Center

Cape Town

Mr. James Moulder, Assistant to the President, University  
of Cape Town  
Mr. Merlyn Mehl, Director, Science Education Resource  
Center, University of the Western Cape  
Doug Young, Professor of Education, University of Cape Town

## IV. RESULTS

The results in Tables 1-26 are based on data collected during the three Training Workshops held in Johannesburg (JHB), the University of Zululand (UZ), and in Cape Town (CT). Although the total number of participants who attended all or part of the training was 76, the numbers reflected in these tables include only those participants who were present during the particular session during which the data were gathered. The data concerning the Study Guides and CDWs were gathered during the first day of the workshop and the data evaluating the workshop were gathered during the last session of the second day.

A. Evaluation of the Training Workshops

Tables 1-6 correspond to questions 1-6 from Participant Evaluation Form E (Appendix II).

Table 1  
Q: How much of the material presented in the Training Workshop was new to you?

Alternatives	JHB	UZ	CT	Responses	
				All	Percent All
Nearly all	2	6	5	13	22%
Much of it	7	13	6	26	43%
Almost half	1	5	4	10	17%
Not very much	2	6	2	10	17%
Almost none	<u>0</u>	<u>0</u>	<u>1</u>	<u>1</u>	<u>1%</u>
	12	30	18	60	100%

Table 2  
Q: How useful is this approach to tutoring presented  
in the Training Workshop?

Alternatives	JHB	UZ	CT	Responses	
				All	Percent All
Very useful	10	18	15	43	72%
Useful	1	11	3	15	25%
Unsure	1	1	0	2	3%
Not very useful	0	0	0	0	0%
Useless	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0%</u>
	12	30	18	60	100%

In Tables 1 and 2, it can be seen that 82% of the participants found much or all of the UPP Training Workshop techniques new to them. In addition, 97% found the non-formal techniques useful or very useful.

Table 3  
Usefulness of the Particular Units (Sessions)  
in the Training Workshop

Session	Location	Very Useful	Useful	Not Very Useful	Not Useful At All	Total
Chapter 2:	JHB	10	2	0	0	12
Introduction to	UZ	17	14	0	0	31
Individualized	CT	11	5	0	0	<u>16</u>
Instruction	All	38	21	0	0	59
	% All	64%	36%	0%	0%	100%
Chapter 3:	JHB	9	2	0	0	11
Instructional	UZ	17	13	0	0	30
Procedures	CT	12	3	0	0	<u>15</u>
with the UPP	All	38	18	0	0	56
	% All	68%	32%	0%	0%	100%
Chapter 5:	JHB	10	1	0	0	11
Task Analysis	UZ	20	13	1	0	34
& Instructional	CT	13	2	1	0	<u>16</u>
Objectives	All	43	16	2	0	61
	% All	71%	26%	3%	0%	100%
Chapter 8:	JHB	11	1	0	0	12
Probing Skills	UZ	28	6	0	0	34
and Questioning	CT	15	1	0	0	<u>16</u>
Techniques	All	54	8	0	0	62
	% All	87%	13%	0%	0%	100%
Chapter 9:	CT*	11	6	1	0	18
Problem Solving	% All	61%	33%	6%	0%	100%

Although all of the sessions were rated very positively, the most consistently highly rated session was Probing Skills (question-asking techniques).

\* Time constraints only permitted this session to be conducted at Cape Town.

Table 4  
Q: How useful do you feel that this workshop will be to you in your future teaching or tutoring?

Alternatives	JHB	UZ	CT	Responses	
				All	Percent All
Very Useful	8	22	14	44	69%
Possibly useful	4	11	4	19	30%
Unsure	0	0	0	0	0%
Not very useful	0	1	0	1	1%
Useless	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0%</u>
	12	34	18	64	100%

Table 4 indicates that 99% of the participants found the training useful or possibly useful. These data are corroborated by the open-ended comment examples in Tables 5 and 6.

Table 5\*  
Q: How can this workshop be improved?

Responses
By making it more applicable to all subjects offered in schools.
By making the workshop spread over more days with fewer hours per day.
By inviting teachers from many schools and by involving those who are concerned with other subjects.
More use of video to demonstrate examples.

\* NOTE: Responses listed are typical of those that occurred most frequently. A complete list of responses on the workshop can be found in Appendix III.

Table 6\*  
Open Comments

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Responses

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It was a very good and useful workshop.

It is critical to have follow-up [workshops].

The workshops could be conducted at a more convenient time.

Workshops of this nature could be very useful if more people [teachers] were invited across the country.

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\* NOTE: Responses listed are typical of those that occurred most frequently. A complete list of responses on the workshop can be found in Appendix III.

B. Evaluation of Study Guides

Tables 7-15 correspond to questions 2-10 from Study Guide Evaluation Form C (Appendix II).

Table 7  
Q: How difficult are the UPP Study Guides for students in general?

Alternatives	JHB	UZ	CT	Responses	
				All	Percent All
Very easy	0	0	0	0	0%
Easy	1	2	0	3	5%
About right	9	22	13	44	80%
Difficult	2	3	3	8	15%
Very difficult	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0%</u>
	12	27	16	55	100%

Table 8  
Q: Assume a student could complete the UPP Study Guides correctly. In that case, which of the following would be true? The JMB exam (for that student) would be:

Alternatives	JHB	UZ	CT	Responses	
				All	Percent All
Very easy	0	3	1	4	7%
Easy	12	20	10	42	75%
Difficult	0	0	1	1	2%
Very difficult	0	0	0	0	0%
Impossible to say	<u>0</u>	<u>4</u>	<u>5</u>	<u>9</u>	<u>16%</u>
	12	27	17	56	100%

Table 9  
Q: How difficult are these UPP Study Guides for teachers such as yourself?

Alternatives	JHB	UZ	CT	Responses	
				All	Percent All
Very easy	0	4	3	7	13%
Easy	1	13	10	24	44%
About right	10	9	4	23	42%
Difficult	1	0	0	1	1%
Very difficult	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0%</u>
	12	26	17	55	100%

Table 10  
Q: Approximately what proportion of Standard 9 and 10 students will need work in introductory basic skills before they are able to use these UPP Study Guides?

Alternatives	JHB	UZ	CT	Responses	
				All	Percent All
None	0	1	1	2	4%
Less than 25%	0	3	7	10	18%
25%-50%	3	3	3	9	16%
50%-75%	1	10	4	15	27%
Almost all	<u>8</u>	<u>10</u>	<u>1</u>	<u>19</u>	<u>35%</u>
	12	27	16	55	100%

Table 11  
Q: How useful are these UPP Study Guides for students who are prepared well enough to use them?

Alternatives	JHB	UZ	CT	Responses	
				All	Percent All
Very useful	10	25	15	50	91%
Somewhat useful	1	2	2	5	9%
Not very useful	0	0	0	0	0%
Not useful at all	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0%</u>
	11	27	17	55	100%

Table 12  
 Q: How helpful are these UPP Study Guides to students  
 who are NOT adequately prepared to use them?

Alternatives	JHB	UZ	CT	Responses	
				All	Percent All
Very helpful	0	3	6	9	16%
Somewhat helpful	0	9	4	13	24%
Not very helpful	4	9	4	17	30%
Not helpful at all	<u>8</u>	<u>6</u>	<u>3</u>	<u>17</u>	<u>30%</u>
	12	27	17	56	100%

Table 13  
 Q: How helpful are these UPP Study Guides to teachers?

Alternatives	JHB	UZ	CT	Responses	
				All	Percent All
Very helpful	12	25	15	52	93%
Somewhat helpful	0	2	2	4	7%
Not very helpful	0	0	0	0	0%
Not helpful at all	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0%</u>
	12	27	17	56	100%

Table 14\*  
Q: How can these UPP Study Guides or this programme  
be improved?

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Responses

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By giving more examples, problems.

Improvements could be made after careful use of the  
[Study] Guides.

By having worksheets to be used with the Study Guides.

By covering the entire syllabus.

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Table 15\*  
Open Comments

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Responses

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The Study Guides are useful and helpful.

These [Study] Guides could be very useful to teachers.

These [Study] Guides should be more available.

More Study Guides in different subjects must be available  
for use by pupils.

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\* NOTE: Responses listed are typical of those which  
occurred most frequently. A complete list of responses  
on the Study Guides can be found in Appendix IV.

The data in Tables 7-15 indicate that the Training Workshop participants believe that the difficulty level of the UPP Study Guides is about right and that students who master them would likely find the JMB matric exam easy. The majority of participants thought at least one-half of Standard 9 and 10 students would need introductory basic skills before they could adequately cope with the Study Guides. However, 100% of the participants said the Study Guides would be useful for students who were prepared well enough to use them. On the other hand, 60% of the participants rated the Study Guides "not helpful" for inadequately prepared students.

C. Evaluation of Concept Development Worksheets

Tables 16-26 correspond to questions 2-12 from Concept Development Worksheet Evaluation Form A (Appendix II).

Table 16

Q: How difficult are these worksheets in general?

Alternatives	JHB	UZ	CT	Responses	
				All	Percent All
Very easy	3	3	5	11	21%
Easy	6	2	5	13	25%
About right	4	18	5	27	52%
Difficult	0	1	0	1	2%
Very difficult	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0%</u>
	13	24	15	52	100%

Table 17

Q: How difficult are these worksheets for teachers and tutors?

Alternatives	JHB	UZ	CT	Responses	
				All	Percent All
Very easy	7	8	9	24	45%
Easy	1	13	3	17	32%
About right	5	4	3	12	23%
Difficult	0	0	0	0	0%
Very difficult	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0%</u>
	13	25	15	53	100%

Table 18

Q: These worksheets are designed primarily to cover concepts that are first taught in Standards 9 and 10. Do you think the material in the worksheets is at the right level? The worksheets for Standards 9 and 10 are:

Alternatives	JHB	UZ	CT	Responses	
				All	Percent All
Too easy	2	4	1	7	13%
About right level	11	21	14	46	87%
Too difficult	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0%</u>
	13	25	15	53	100%

Table 19

Q: How many Standard 9 and 10 students could benefit from working through a complete set of Standard 9 and 10 worksheets such as these?

Alternatives	JHB	UZ	CT	Responses	
				All	Percent All
None	0	0	0	0	0%
Less than 25%	0	1	1	2	4%
25-50%	1	5	1	7	13%
50-75%	4	5	4	13	25%
Almost all	<u>8</u>	<u>14</u>	<u>9</u>	<u>31</u>	<u>58%</u>
	13	25	15	53	100%

Table 20

Q: How useful are these worksheets for students in Standards 9 and 10 who need help with maths?

Alternatives	JHB	UZ	CT	Responses	
				All	Percent All
Very useful	12	20	13	45	85%
Somewhat useful	1	5	2	8	15%
Not very useful	0	0	0	0	0%
Not useful at all	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0%</u>
	13	25	15	53	100%

Table 21  
Q: How helpful are these worksheets for teachers?

Alternatives	JHB	UZ	CT	Responses	
				All	Percent All
Very helpful	12	18	13	43	83%
Scmewhat helpful	1	5	2	8	15%
Not very helpful	0	1	0	1	2%
Not helpful at all	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0%</u>
	13	24	15	52	100%

Table 22  
Q: How helpful are these worksheets for students as a  
supplement to their work in school?

Alternatives	JHB	UZ	CT	Responses	
				All	Percent All
Very helpful	11	19	14	44	83%
Somewhat helpful	2	5	1	8	15%
Not very helpful	0	1	0	1	2%
Not helpful at all	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0%</u>
	13	25	15	53	100%

Tables 16-22 indicate that participants rated the CDWs easy to work with and at the right level for Standards 9 and 10. Further, the ratings indicate most students could benefit from the worksheets and that they would be particularly useful for students who need help with maths. As designed, the CDWs are seen as useful supplementary materials.

Table 23  
Q: How much more helpful are the Study Guides if the worksheets are available?

Alternatives	Responses				
	JHB	UZ	CT	All	% All
Worksheets make the UPP Study Guides much more helpful	12	23	13	48	91%
Worksheets do not affect the value of the UPP Study Guides	0	3	1	4	7%
Worksheets make the UPP Study Guides less helpful or unnecessary	<u>0</u> 12	<u>0</u> 26	<u>1</u> 15	<u>1</u> 53	<u>2%</u> 100%

Table 24  
Q: Do you think worksheets like these should be developed to cover Standards 9 and 10 concepts in maths, science, and English?

Alternatives	Responses				
	JHB	UZ	CT	All	Percent All
Yes	12	23	15	50	94%
Maybe	1	2	0	3	6%
No	<u>0</u> 13	<u>0</u> 25	<u>0</u> 15	<u>0</u> 53	<u>0%</u> 100%

Over 90% of the participants indicated the CDWs make the UPP Study Guides more helpful than without them. Concurrently, 94% indicated CDWs in all three areas should be developed.

Table 25\*  
Q: How can these Concept Development Worksheets  
be improved?

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Responses

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These guides [worksheets] will be very useful in preparing a student for the matric exam.

It [the worksheets] should cover the whole syllabus.

A more durable cover is needed.

[The worksheets are] clear and direct.

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Table 26\*  
Open Comments

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Responses

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The worksheet is very useful, helpful.

[The worksheets] should be made freely available.

Study Guides should be introduced to teachers at beginning of year.

Teachers should see that these are properly used.

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\* NOTE: Responses listed are typical of those which occurred most frequently. A complete list of responses on the Concept Development Worksheets can be found in Appendix V.

D. Results from Special Meetings

The following summaries were based upon discussion and reflection of UPP staff (Majer and Hedges) after reviewing notes taken during the meetings indicated. These summary statements include input from Mr. Earl Yates, AID representative, from those meetings at which he was present. An asterisk (\*) designates the meetings where Yates was present in addition to Majer and Hedges.

Table 27  
Special Meeting Summary Comments

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Meeting: EOC/St. Ansgars\*

Persons: Bernadette Mosala  
Barry Mosaga  
Mokgethi Motlhabi

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Summary Comments/Conclusions:

1. They need worksheets immediately.
  2. Barry Mosaga is a talented and effective coordinator of the EOC Alternative Education School (St. Ansgars).
  3. St. Ansgars has 400 adult and student participants 4 nights each week. Some participants walk miles to attend.
  4. Their highest priority is to provide more in-country training in nonformal teaching techniques. They would like trained trainers in South Africa.
-

Table 27 (continued)

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Meeting: TAC Advisory Board\*

Persons: Nic Mogatusi  
 Motobati  
 Morepe  
 Tony

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Summary Comments/Conclusions

1. TAC wanted more background on evolution of the UPP.
  2. They declined to participate in Johannesburg training because of lack of communication during 6-month non-funded period.
  3. They were offended by USIS seeking involvement with other organizations instead of requesting reasons for lack of TAC participation (this contradicts reported efforts by USIS).
  4. Morepe told SACHED the maths Study Guides were too easy, not too hard.
  5. TAC may not want to participate in the UPP if it is opened to other organizations (e.g., ATASA).
  6. TAC wants to use UPP materials without participation in training.
  7. They suggested sending South African subject specialists to U.S. (CGI) to work as writers.
  8. TAC perceived the value of the UPP to be high even though they elected not to participate at this time.
-

Table 27 (continued)

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Meeting: ATASA\*

Persons: Joyce Buku  
H.H. Dlemlenze  
Phyllis Lerutoane

---

Summary Comments/Conclusions:

1. ATASA suggested a white UPP training coordinator in South Africa to avoid in-fighting among black groups.
  2. The SACHED upgrade training with 100 teachers is going well.
  3. They reminded CGI that the black community had insisted on JMB, not other matric exams.
  4. Joyce reported to the Principals' Council of Soweto that UPP training should be offered to many more ATASA teachers; that the UPP was helpful in getting teachers to look at teaching in another fashion; that the UPP learner-centered approach was very effective; and that Study Guides should be available to many more teachers.
  5. Ninety percent of the 5000 Soweto teachers have not passed matric.
  6. There are 82,000 black teachers in the country and they are less likely to be as well prepared as those in Soweto.
  7. There are approximately 60 high schools in Soweto and approximately 300 teachers teach at matric level. This should be the target for the UPP.
  8. Training may be most effective if black, politically inspired groups are kept separate.
-

Table 27 (continued)

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Meeting: SACHED\*

Persons: John Samuel  
Klaas Mashishi  
(Nic Mogatusi)  
(Mokgethi Motlhabi)

---

Summary Comments/Conclusions:

The following is the draft text of a memorandum from Earl Yates, to PAO Lewinsohn, drafted after meetings with John Samuel on September 21-23, 1982.

FROM: Earl Yates, AID/Afr/SA (TDY South Africa)

TO: Jodie Lewinsohn, PAO, Pretoria

SUBJECT: Reproduction and Delivery of UPP Study Guides by SACHED

1. SACHED Director John Samuel contracted with CGI President Ken Majer on June 18, 1981, and subsequently received payment, to reproduce 300 copies each of the 50 Study Guides in English, maths, and physical sciences for the UPP. He was to deliver these to the American Cultural Center in Johannesburg prior to the September 10-11, 1982 training session. An inventory of the materials received at the American Cultural Center showed that he had delivered less than one-half of the materials. Ken Majer telephoned John about the shortfall and arranged a meeting with him on Tuesday, September 23. Ken, Larry Hedges, and I went to the meeting. Also participating, besides John, were his deputy, Klaas Mashishi; Mokgethi Motlhabi, Director of the Educational Opportunity Council; and Nic Mogatusi, TAC.
2. During the meeting, John argued that there were two reasons for the shortage in the number of Study Guides delivered. First, he argued, Ken had agreed that SACHED could retain 100 copies of the maths Study Guides for the purpose of evaluating them. Ken stated that he had not agreed to this and that the 300 copies of each Study Guide, as specified in the signed agreement, was what we expected to receive. Second, John argued, he had distributed several sets of Study Guides to other organizations to evaluate. He said that Ken had agreed following the January 1982

Table 27 (continued)

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training session that the materials could be distributed for that purpose. Ken argued that he had agreed only to a set of the materials being provided to the Namibia Council of Churches for evaluation since two of its members/tutors had participated in the training session. He stated that he had not agreed, nor had they ever discussed, materials being randomly distributed by SACHED.

3. Continued discussion of these issues did not resolve the disagreements. Because of the impasse, we conceded on John's claim to 100 of the maths Study Guides for SACHED's use. Still, there was a notable contradiction in John's argument. He insisted that he had a rightful claim, on the basis of a verbal agreement superceding the written contract, to 100 copies of the maths Study Guides. Yet, he had determined as early as January of this year that they were too difficult for the students. He has never satisfactorily explained why he needs them if they are too difficult.
4. On the issue of Study Guides, beyond SACHED's 100, distributed to other organizations for evaluation, I told John that AID would need the results of those evaluations as input to our decisions on whether to continue support to the UPP. We would expect, I told him, that he could provide either 100 Study Guides or the results of their evaluation.
5. In the end, John agreed to comply with the requirements of the written contract, with the exception of SACHED's retaining the 100 maths Study Guides. In a brief agreement note that he and I initialed, he agreed to the following:
  - A. Delivery to the American Cultural Center by COD, Thursday, September 23, 200 copies of the maths Study Guides and 300 copies each of the English and physical sciences Study Guides.
  - B. Return to Ken the original copies from which the Study Guides were to be reproduced.
  - C. Report to me in two weeks (by October 5, 1982) the results of the evaluations of Study Guides done by the organizations to which he distributed them. The report will specify the following:

Table 27 (continued)

- (1) the number of Study Guides distributed;
- (2) to whom they were distributed;
- (3) how they were used;
- (4) findings concerning their suitability.

He agreed verbally that we could pick up the originals by 5:00 that day and that he would begin delivery of Study Guides to the American Cultural Center immediately.

6. When we returned at 5:00 to pick up the original copies, he had only those of the English Study Guides, stating, without clearly specifying why, we would have to pick up those for maths and physical sciences the following day. We agreed to return at 5:00 on Wednesday.
7. Apparently very agitated, John told me that he had consulted with his staff following our meeting that morning. He had concluded that SACHED could not, as he had agreed in the initialed note about four hours earlier, produce in two weeks the report on the use of the Study Guides that he had distributed to other organizations. It was just too heavy a demand on his staff, and, very pointedly, we could not "come in here and make demands on us!" I reminded him that we would need the evaluation data for our deliberations in Washington. He stated that he could report within the agreed-upon two week period the number of Study Guides distributed and to whom. Regarding the results of the organizations' evaluation of them, his staff was too busy to do it within the agreed time and we would just have to wait until they "got around to it." I asked if SACHED would be able to report the results at all. He replied that it could, when staff time allowed.
8. We returned on Wednesday at 5:00, as agreed the previous day, to pick up the original copies of the maths and physical sciences Study Guides. John told us that the printer had to hold them until all the copies had been reproduced. We chose not to argue this point and agreed to come by the next day to collect the originals.
9. The next day, Thursday, was very busy, and we decided to simply call John and request the originals be delivered with the Study Guides to the American Cultural Center. When Ken Majer called SACHED on Thursday, to make this request, John would not speak

Table 27 (continued)

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to him. Ken left the message with the receptionist, requesting the originals be delivered to the American Cultural Center by the end of the day, Thursday, September 23.

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Meeting: University of Zululand

Persons: Professor Vos  
Dr. Nkabinde  
Dr. Styen

---

Summary Comments/Conclusions:

1. Some follow-up to training is needed.
  2. They would like an in-country trainer in residence.
  3. If we don't work with schools where a vast majority of students are, apartheid will be perpetuated.
  4. They believe UPP should train Kwa Zulu Education Department resource personnel and inspectors.
  5. The University of Zululand is prepared to offer any aid, resources, coordination, and support to help UPP training continue throughout Zululand.
-

Table 27 (continued)

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Meeting: Durban Urban Foundation

Persons: Mr. Garrib (Education Manager, Natal Region)

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Summary Comments/Conclusions:

1. Mr. Garrib was concerned that he was not aware of the UPP earlier.
  2. He had immediate need for training and materials.
  3. He offered to help produce (print) UPP materials.
  4. The Urban Foundation has 300 teachers involved in an upgrade program, 80% of whom have not passed matric.
  5. There are 100 continuing education centers (evening schools) in the area that could benefit from the UPP.
  6. The Urban Foundation has 35-40 tutors who need training immediately.
- 

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Meeting: UPE Continuing Education Center/  
Careers Development Project\*

Persons: Professor Botha  
Mr. Winky Ximiya

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Summary Comments/Conclusions:

1. There are currently 200 teachers involved in PE matric upgrade programs.
  2. They would like to offer a specific course to upgrade teachers for JMB matric.
  3. Mr. Ximiya had at one time (before 1980 disturbances) 400 students in alternative matric preparation courses. He would like to restart.
-

Table 27 (continued)

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Meeting: University of Cape Town\*

Persons: Mr. James Moulder  
Mr. Doug Young

---

Summary Comments/Conclusions:

1. The University of Cape Town Education Department would like to cooperate in dissemination of program (with student teachers).
  2. As moderator for JMB English exam, Dr. Young asserts that matric exams are perceived to be more equal now.
  3. Moulder would like to explore University of Cape Town post-doctoral fellowships for American educators interested in teacher upgrading.
- 

Meeting: University of the Western Cape\*

Persons: Mr. Merlyn Mehl

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Summary Comments/Conclusions

1. Mr. Mehl would like to cooperate in dissemination of the UPP via teacher education program and contacts with schools via Cape Town's Professional Teachers' Association.
  2. Mr. Mehl is a member of an all-Cape alternative education group interested in matric preparation.
-

## V. CONCLUSIONS

The results of the evaluation and questionnaire data in conjunction with the direct feedback from individual meetings indicate a high regard for the UPP countrywide. Although SACHED and TAC have, from time to time, been critical of the project, this high regard was also given verbally (by TAC) and unobtrusively (by SACHED and TAC) through requests for the materials. It appears, however, for various political reasons, the original Johannesburg groups have differences among themselves that have led to unwarranted criticism of the UPP in spite of its acknowledged value. Unanimous positive assessment of the program from others in Johannesburg and others throughout the nation further support this contention.

Given the enormous deficit in teacher preparation and the underpreparedness of black students in South Africa, the results may be partially a function of a sincere desire for "any help they can get." Nevertheless, as a program based on three years of in-country cooperation, the UPP shows potential as both a teacher upgrade program as well as a viable avenue for helping high school students prepare for matric.

The complete results suggest the following 14 specific conclusions:

1. UPP nonformal techniques have potential usefulness in both alternative education settings and in classrooms.
2. UPP training was seen as a valuable teacher upgrade program (skills) as well as matric preparation (content).
3. It makes the most sense to work with teachers in schools as well as those involved in alternative education settings, as long as all participants become involved as individual professionals (personally or through associations), but not as representatives of the formal education system.
4. UPP Study Guides are useful as-is for teachers who wish to upgrade themselves, and for students who have completed Standards 9 and 10 (or equivalent) who wish to pass matric.
5. There is an immediate perceived need for the Concept Development Worksheets. The data indicate that the CDWs would be valuable to the majority of Standard 9 and 10 students.

6. UPP Study Guides would be valuable to many more students if the CDWs were available in all three subject areas.
7. CDWs are very well-written and extremely well-received.
8. Training sessions were positively received and seen to be valuable.
9. Follow-up training was requested and is needed.
10. A high priority for UPP implementation would be to train South Africans at CGI to become in-country trainers and resource personnel.
11. Only one of the original agencies (EOC/St. Ansgars) seems suitable to implement the UPP in any systematic fashion.
12. Political considerations/differences make it difficult to work with the original Johannesburg groups.
13. Other Johannesburg interest through ATASA is very high.
14. Strong interest was indicated in continuing/expanding the program in Zululand, Durban, Port Elizabeth, and the Cape region.

#### VI. A FINAL NOTE

An informal poll was taken among the workshop participants asking them to record the number of students with whom they have regular contact. Fifty-eight participants responded. The average number of students each participant meets and teaches on a regular basis is 182.

Since these pilot UPP training workshops exposed 76 participants to new instructional methods that could benefit students, the "multiplier effect" of these pilot workshops alone produces potential impact on over 13,000 students. Additional benefits, of course, will be due to skills upgrading among students who obtain copies of the UPP study materials.

One caveat: a little knowledge can sometimes do more harm than good. These participants gained "a little knowledge." As they clearly acknowledged through their requests for follow-up training, there is a strong need for continued participation in additional training activities of this type. Such follow-up would provide the participant with more comprehensive training and additional opportunities to build rapport through a support network of participants and trainers.

In any case, should this effort continue, there is little doubt that the "multiplier effect" in this type of activity could easily enhance the skill level of hundreds of thousands of students and teachers in the target population in a timely, cost-effective manner.

APPENDIX I

Concept Development Worksheets  
Aims, Uses and Report by Jennifer Glennie

## Appendix I

### Concept Development Worksheets Aims, Uses and Report by Jennifer Glennie

Feedback from the community during and after the introduction of the UPP in South Africa in January, 1982 indicated the UPP Study Guides would likely be too difficult for most students. Requests were made for basic skills instructional worksheets to supplement the UPP Study Guides. These Concept Development Worksheets (CDWs) would aim to bring students up to the level of the UPP Study Guides.

One of the main objectives of Phase II of the program was to design and develop initial CDWs in mathematics. To ensure this development was conducted in cooperation with the South African community, Ms. Jennie Glennie, South African maths specialist with extensive educational experience with the black population, came to the United States to help develop and design the CDWs. The following document, "Concept Development Worksheets in Mathematics, A Working Document on their Aims and Intended Use" was prepared by Ms. Glennie during her working visit to CGI in San Diego from August 9 to August 26, 1982. Her report, "Report on My Visit to the University Preparation Programme for Black South Africans, The Consulting Group, San Diego: 9-26 August 1982" follows the working document in this appendix.

REPORT ON MY VISIT TO THE UNIVERSITY PREPARATION PROGRAMME  
FOR BLACK SOUTH AFRICANS, THE CONSULTING GROUP, SAN DIEGO:  
9 - 26 August 1982

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By the time of my visit, Phase I of the Programme, namely the development of Study Guides for Physical Science, Mathematics and English, had been completed, and Phase II had been embarked upon two months previously. One of the major facets of this phase was the production of Concept Development Worksheets in Mathematics. These Worksheets had been requested by some of the prospective users of the materials, since they felt that the Study Guides served largely to consolidate and review concepts for examination purposes and thus in the main failed to teach understanding of concepts and how to approach problem solving. The Worksheets were to serve this purpose.

SACHED (who initiated my visit) and I thus saw my visit as an opportunity for a South African, with extensive experience in the production of educational materials for black students, to help formulate the detailed aims of the Worksheets and participate in their design. I believe that my visit was most fruitful in this regard. I was cordially received and offered every opportunity to work constructively with the staff of the Consulting Group.

I spent considerable time with the writers and the professional reviewer discussing the problems they had encountered in the first stage of the development of the Worksheets, and suggesting ways in which to overcome these problems. The problems centred around three issues. The first was lack of clarity on the aims of the Worksheets. The writers were caught between concentrating on the one hand on providing the prior skills and subconcepts necessary for understanding the concepts identified in the Study Guides, and on the other hand on developing and teaching these concepts. If the materials were to be logically and coherently developed, the focus had to be clearly placed on one or other aim. A second and related problem was that writers were unclear both about what prospective students were likely to know and in what circumstances they would be studying. Finally, there was

Continued/...2

71

considerable concern from both the reviewer and myself that, given the difficult nature of the JMB exam, the necessary problem solving skills were not being adequately developed. Instead the existing Worksheets presented definitions and notations and did not go beyond this to help students develop their own approaches to novel problems. This concern was particularly pertinent given the pervasiveness of rote-learning in South African schools.

After extensive discussion among the Mathematics course writers, the professional reviewer, the project director, the project senior consultant and myself, the attached document, Appendix I : CONCEPT DEVELOPMENT WORKSHEETS : Their Aims and Intended Use, was agreed upon. My remaining time in San Diego was spent working with the writers in developing a format for future Worksheets (Appendx 2) and in assisting them in the initial stages of production of the first two Worksheets. It is now imperative that these materials be carefully evaluated through use by prospective students so that our design can be tested and the necessary modifications made.

The changes agreed upon thus far are fairly significant in at least two respects. First, those Worksheets which had already been produced on my arrival required very considerable revision. Secondly, the new design of the Worksheet appears to demand both more preparation time and a larger number of pages per Worksheet. There are obvious budgetary implications. I do, however, believe that these are necessary modifications and hence deserve the requisite finance.

In conclusion, I would like to note that the task of the Mathematics writers is made all the more difficult by their having had no first hand knowledge or experience of the audience for whom they are writing. Every effort needs to be made to ensure that this considerable impediment is lessened in as far as is possible. At the very least, extremely regular communication with South African Educationists and feedback from typical students studying in South Africa throughout this development stage must be ensured. It should then, I believe, be possible to produce Mathematics Worksheets which can be put to considerable use in South Africa.

Jennifer Glennie  
24 September 1982

## CONCEPT DEVELOPMENT WORKSHEETS IN MATHEMATICS:

### Their Aims and Intended Use

#### 1. AIMS OF THE CONCEPT DEVELOPMENT WORKSHEETS (CDWs)

The UPP Study Guides together with the CDWs aim to provide the necessary teaching and examination preparation which would enable students, who have already passed Standard 8, to pass the JMB Higher Grade Matriculation Examination. The Study Guides will serve the essential function of consolidating and integrating necessary concepts. The CDWs will serve to teach the concepts and skills required by the Standard 9 and 10 syllabus in as interactive a way as possible. Where necessary, students will be asked to recall concepts contained in the Standard 8 (or below) syllabus. Answers will be provided for any such recall-type questions, but teaching of these concepts will not generally be included. Rather, students will be given some reference to follow up for themselves.

Given the nature of the students for whom the materials are being prepared, the worksheets need:

- i) to develop the new Standard 9 and 10 concepts systematically and, initially, slowly, allowing for as much student involvement as possible;
- ii) to pay special attention to the development, at a fairly basic level, of mathematical skills and approaches which, because of poor teaching, students are unlikely to have developed;
- iii) to concentrate on the acquisition of problem-solving skills necessary for the JMB examination;
- iv) to utilise simple language for all explanations but to move to greater complexity in the expression of problems. Assistance would be given to students to understand the more complex language of such problems:

Each worksheet will deal with one of the concepts identified in the Study Guides. However, the order of the worksheets need not be the same as the order in which the concepts were developed in the Study Guides.

## 2. PROPOSED USE OF THE CDWs

The worksheets will be designed so that students are able, if necessary, to rely on them to attain the requisite concepts and skills. The worksheets can thus be used as self-instructional texts by students who are not attending school. However, the materials would be more effective if the students had regular access to a study group and a peer aide. Students who are attending school could, of course, use the worksheets in parallel with their classroom activities.

Teachers could either draw on the worksheets for a systematic coverage of the content or as a resource towards developing their own teaching approach. Alternately, if a sufficient number of copies were available, they could require students to study the worksheets on their own, allowing the teacher more time to help students solve their particular problems.

## 3. PROPOSED STUDENTS

For the purposes of the development of the worksheets, we make a number of assumptions about students. In some cases, these assumptions may be incorrect. In section 4, we outline suggestions for dealing with situations in which our assumptions are incorrect.

Our assumptions about the students are:

- i) that students have passed the Standard 8 examination, but have had little or no exposure to Standard 9 and 10 concepts;
- ii) that students have been taught in classes of sixty or seventy students by teachers whose own knowledge of mathematics is poor and whose command of English is inadequate. In such situations rote learning is often encouraged to the exclusion of all else. Thus, although students will have passed Standard 8, they are unlikely to have developed appropriate approaches to the study of mathematics. They will have little appreciation of the nature of proof, they will have few problem-solving skills, they will be unable to derive solutions logically, etc.;

Continued/...3

iii) that such students will be using English at a second language level. They will have a limited vocabulary and will have difficulty in understanding sentences where the construction is complex. In particular, the passive voice causes problems. Materials should thus initially use very simple language and gradually expose students to an increased mathematical vocabulary. In each of the four categories of material (i.e., Algebra, Geometry, Trigonometry and Vector Algebra) an attempt will be made to help students understand more complex sentence construction with particular respect to the JMB examination questions.

#### 4. DIAGNOSTIC TESTS

So as to ensure that students comply, in as far as is possible, with the assumptions above, it will be useful to ask prospective students (who should in most cases have passed Standard 8) to take a single, or a series of, diagnostic test(s). The first such test would be of the Standard 8 level and would serve to highlight any serious gaps in knowledge which would prevent students from proceeding to the Standard 9 and 10 work. Such students would be directed to the available resources at the Standard 8 level and below level. Should students do well in their first test, they would proceed to a test of a higher level which would serve to direct students to some or all of the worksheets or to the UPP Study Guides. The overall system needs to be flexible enough to allow students or tutors to adjust initial decisions made on the basis of the diagnostic tests.

#### 5. WORKSHEET DESIGN AND FORMAT

Each worksheet will consist of the following components:

- i) general introduction to the purpose and use of all worksheets;
- ii) introduction to the particular worksheet. Here we will indicate the concepts contained in each of the lessons of the worksheet and show how these concepts add up to concepts of the Study Guides;

- iii) a number of lessons;
- iv) if necessary, a worksheet consolidation which will serve to summarise all the concepts contained in the worksheet and introduce items which draw on all or some of these concepts;
- v) a graded worksheet test, consisting of five to ten items, which will serve to recall all the concepts of the lesson and test their correct application to more or less complex problems.

Each lesson will consist of the following components:

#### Lesson Introduction

This section will prepare both physically and mentally for the particular lesson. Students will be told what, if any, particular equipment they might need. A brief description of the lesson and the way in which it relates to previous lessons will be given.

#### Objectives

The objectives will define precisely what the students should be able to do by the end of the lesson.

#### Revision

In this section, students will be asked to recall any information which they may have learned in Standard 8 or in earlier worksheets, but which is necessary for the development of the concepts in this lesson. Writers will provide answers to any such questions. If students are unable to answer the questions correctly, writers would provide references for them of where they could find the relevant information.

The main body of the lesson will involve helping students to learn new concepts. Writers should try to involve them as actively as possible in this learning process, even, where appropriate, leading students to discover new relationships for themselves. To make this process easier, writers should break down the concepts into manageable parts, each of which needs to have a clear purpose. Students should be required to test their

recall and ability to apply these concepts in exercises. Moreover, both through teaching and exercise items, writers should begin to develop students' problem-solving abilities, requiring them not only to read and translate problems, but also to analyse them and plan their solution. Where writers need to draw on Standard 8 knowledge, simple recall plus references will be included in the solution section.

The main body of the lesson will therefore consist of a number of cycles of:

REVISION (where necessary)  
INFORMATION AND PROBLEM-SOLVING  
EXERCISE (five to ten items)

Having broken down the information, writers need to put it together again for the students. In addition, they need to be able to select relevant information to apply to particular problems. We therefore need a

LESSON CONSOLIDATION

This section would serve three purposes:

- i) to summarise the content of the lesson;
- ii) to test students' ability to apply all the concepts taught in the lesson;
- iii) to test students' ability to use these concepts in the solution of problems.

Should there be only one concept in any given lesson, it might be sensible to omit this section.

A typical worksheet will thus have the following components:

- i) General Worksheet Introduction
- ii) Particular Worksheet Introduction
- iii) A Number of Lessons with the Following Components:
  - Introduction
  - Objectives
  - Revision ) This cycle would
  - Information and Problem Solving ) be repeated as
  - Exercise ) many times as is
  - Consolidation : Summary ) necessary.
  - Consolidation Exercise )

- iv) A Consolidation Lesson (where necessary)
- v) Worksheet Test
- vi) References to Standard 8 Concepts

J A Glennie  
August 1982

MATHS WORKSHEET FORMAT MANUAL

THE MATHS WORKSHEETS (4 sp from top)

(4 sp) These materials are designed for students who have completed the Standard 8 syllabus, or its equivalent, in mathematics. The worksheets aim to help you learn the Standard 9 and 10 concepts which you need for the matric exam. To help you prepare for that exam, you should also work through the *University Preparation Programme* Study Guides.

(2½ sp) There are over fifty worksheets. Each worksheet contains a number of lessons. Each lesson has the following sections:

15 19 43

↓ ↓ ↓

- (3 sp) A. INTRODUCTION which prepares you for the lesson;
- (2 sp) B. OBJECTIVES which describes what you will be able to do after you've completed the lesson;
- C. REVISION which helps you to remember what you are expected to already know from Standard 8;
- D. INFORMATION AND PROBLEM-SOLVING which introduces new information and helps you use this information to solve problems;
- E. EXERCISES which contain problems for you to do to see if you've understood what you've learnt;
- F. CONSOLIDATION which summarizes the lessons and contains questions on all the objectives of the lesson;
- G. ANSWERS which describe how to answer the questions in the consolidation section.

(3 sp) Sections C, D, and E above may appear more than once in each lesson depending on the number of objectives in the lesson.

(2½ sp) The last part of the worksheet, the WORKSHEET TEST, will put all of the lessons together into the form you can expect to find in the *University Preparation Programme* Study Guides. Finally, there is a REFERENCE section. Here we will give you page references to Standard 8 textbooks.

MATHS WORKSHEET NO. 00 (4 lines from top)

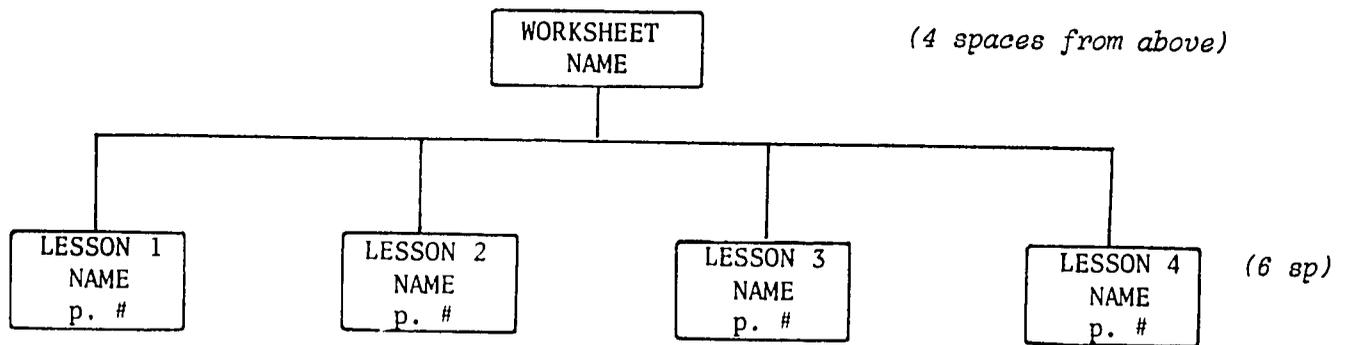
TITLE (dbl space)

10

+

(4 sp) Introductory paragraph to explain in general terms what the worksheet covers and how it fits in with other worksheets. It would also refer to the relevant Study Guide.

(2 sp) The chart below shows that there are \_\_\_\_\_ maths ideas for the maths concept: \_\_\_\_\_ . Each idea is presented in a separate lesson. Therefore, this worksheet is divided into \_\_\_\_\_ lessons. Each lesson is then specifically outlined according to the general structure on page 1. Each lesson has a number of objectives (or purposes).



(NOTE: Sizes of boxes in chart may vary with length of lesson names.)

## HOW SHOULD YOU USE THIS WORKSHEET? *(4 lines from top)*

10

+

*(4 sp)*

*Mouse  
working  
hard at  
desk  
(writing)*

30

+

You should carefully work through each lesson in the worksheet. *Read the information, answer the questions, and do the exercises.* The exercises will help you to understand what you have read. Make sure you can work each problem. Don't skip problems which may seem too easy or too difficult. We will always give you the answers to these problems, but you must try to solve the problems before looking at the answers. Follow the directions carefully. They will tell you how to proceed if difficulties arise.

*(4 sp)*

You will need the following materials for this worksheet:

*(2 sp)*

*Mouse with  
materials*

-- an exercise book

*(1½ sp)*

-- a pencil or pen

-- a ruler

## GENERAL LESSON &amp; WORKSHEET CONSOLIDATION NOTES

- a. All questions, except those in the consolidation exercise, will be numbered sequentially. Students will be given space for short answers ( \_\_\_\_\_ for words), but they will be required to use their exercise books for longer answers. We will provide answers to all such questions at the bottom of the page on which the questions appear.
- b. Any diagrams will be placed on the right-hand side of the page.
- c. All ▲ Theorems, ● Definitions, ▲ Properties, and ▲ Relationships should appear in boxes as follows:

10 13

↓ ↓

▲ Theorems

*Text starts here.*

- d. When definitions appear, the term being defined should be in italics.

- e. Examples should be boxed as follows:

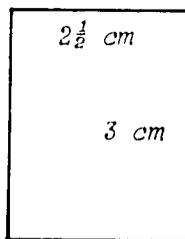
10 13

↓ ↓

★ Examples

*Text starts here.*

- f. Certain paragraphs may have particular logos next to them. All logos will be of same size.



30

↓

*Text starts here.*

. . . . .

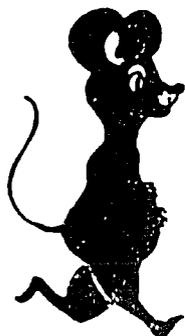
*Text continues here.*

↑

13

MISCELLANY

1. All unknowns in equations are italicized.
2. All important words and phrases are italicized. Italics replace underlining in earlier drafts.
3. Proofs use the same format as other problems. If the student requires more space than is given, he/she can work on a separate sheet of paper.
4. Units (e.g., cms) will NOT be in italics!
5. The paper these worksheets will be printed on is taller and narrower than  $8\frac{1}{2} \times 11$ . Therefore, make sure you leave WIDE (1") margins on the RIGHT side of odd-numbered pages and the LEFT side of even-numbered pages. 10 spaces to either side is a good rule of thumb.
6. Typestyles are:  
Headings: Orator (make sure you switch to 10-pitch)  
Italics: Light Italic  
Text: Adjutant  
Symbols: Symbol I and Symbol II (conversion charts on typewriter)
7. Mice are used as "comic relief" to break up the text.



GO ON TO  
(Good for pages  
with blank  
space at the  
bottom you  
need to fill)



Idea Completed  
(Usually at end of  
Consolidation answers  
and solutions)



Hard Concept  
(Good for  
Summary  
sections)



CONFUSED?



GO BACK TO  
(For Revision  
or other  
sections)

(4 sp from top) LESSON NUMBER

(double sp) LESSON NAME

13

↓

INTRODUCTION *Text starts here.*

*Text continues here.*

(3 sp) OBJECTIVES

After completing this lesson, you will be able to:

(2 sp)

1.1 *Write objective here.*

*These are the numbers for Lesson I. The numbers for Lesson II would be: 2.1, 2.2, 2.3, and so on.*

1.2 *Write objective here.*

1.3 *Write objective here.*

*And so on.*

*There are TWO options at this stage.*

OPTION ONE:

REVISION

This section will remind you of information you need for this section. Read the section carefully, answer any questions, and check that your answers are correct. The correct answers appear at the bottom of the page.

(2 sp)

*Text continues here*

(3 sp) INFORMATION AND PROBLEM-SOLVING: TITLE OF SUBSECTION (*content*)

(2 sp) *Text starts here.*

OPTION TWO:

REVISION

This section will remind you of information you need for this lesson. Read the section carefully. If you need more information, turn to the Standard Eight References at the end of the worksheet.

(2 sp)

*Text continues here.*

ANSWERS: 1. \_\_\_\_\_, 2. \_\_\_\_\_, 3. \_\_\_\_\_, 4. \_\_\_\_\_

*The space allowed will vary according to requirements.*

51

INFORMATION AND PROBLEM-SOLVING: TITLE OF SUBSECTION (*content*)

(2 sp) Study this section carefully. Answer the questions and check that your answers are correct. The correct answers appear at the bottom of the page.

(2 sp) 1. *Text continues here.*

30

(3 sp) EXERCISE

This exercise tests your understanding of the instruction on page(s) # (and #). Try each question. Then check your answer against the one given at the bottom of the page.

*The questions will be numbered sequentially following on from the numbers used in the information section (above). Students will be expected to answer longer questions on a separate sheet, while space will be provided for shorter answers. Our answers will be provided at the bottom of the page.*

2. *Text continues here.*

INFORMATION AND PROBLEM-SOLVING

EXERCISE

} *There will be subsequent cycles of these sections.*

---

ANSWERS: 5. \_\_\_\_\_, 6. \_\_\_\_\_, 7. \_\_\_\_\_

(4 sp)

↓  
 CONSOLIDATION SECTION FOR LESSON #

◆ Summary

*Text starts here.*

40

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CONSOLIDATION EXERCISE

Answer these questions in your exercise book.

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QUESTIONS

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(2 sp) 1. *Text is written here. Figures go on the right.*

(2 sp) a. *Sub-categories with double-spacing.*

(2 sp) b.

c.

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2.

a.

b.

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*If a number of questions pertain to the same figure, draw the figure to the right and refer to it: e.g., Using the figure opposite, answer the questions which follow.*

3.

*(These should be questions unrelated to each other: i.e., the answer to the second does not depend upon the answer to the first.)*

4.

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**NOTE:** *All questions pertaining to a specific figure MUST be on the same page with the figures!*

**NOTE:** *Leave the same amount of space for all figures on a page (if there are more than one).*

**NOTE:** *Consolidation sections always start on an odd-numbered page and continue, if necessary, on the next odd-numbered page.*

**NOTE:** *Place hints immediately after the problem in parentheses.*

CONSOLIDATION ANSWERS

This page is divided into two sections. On the left-hand side, we have the correct answer. On the right-hand side, the solution section, we have explained how we reached the answer.

(3 sp) Answers

(2½ sp)

- 1. a.
- b.
- c.

- 2. a.
- b.

3.

4.

(2 sp between answers)

(1½ sp bet a,b,c, etc.)

-

Happy  
Mouse

ANSWERS  
CORRECT

(List ALL answers on this page even if the solutions "run on" for one or two more pages.)

If answers run over onto the next page, put

GO ON TO  
PAGE \_\_\_\_.

"Go to"  
Mouse

Perplexed  
Mouse

CONFUSED?



Solutions

(Solutions can run over onto the next two pages if necessary.)

If solutions run over into the next page, put

GO ON TO PAGE \_\_\_\_.

(centered)

Answers (con't)  
(if necessary)

Solutions (con't)

Mouse  
who's seen  
the light

NOW YOU'VE GOT IT!

(centered)

RECHECK YOUR ANSWERS AND GO ON TO PAGE \_\_\_\_.

(Use these phrases on final page of solutions  
only!)

## WORKSHEET CONSOLIDATION (4 sp from top)

(4 sp)  $\Rightarrow$  INFORMATION AND PROBLEM-SOLVING

(2 sp) Before you do the worksheet test, we are going to bring together all the ideas covered so far in this worksheet.

*Notes as in earlier sections r.e. theorems, examples, etc.*

(3 sp)  $\Rightarrow$  PRACTICE EXERCISE

*Same format as consolidation exercise.*

*NOTE: This is an optional section of the worksheet.*

Answers

Solutions

*At the end of the last page of answers, type:*

Now you should be ready to proceed to the Worksheet Test.

*(Put this in the position usually occupied by "NOW, YOU'VE GOT IT!")*

WORKSHEET TEST

(4 sp from top)

13  
↓  
(4 sp) DIRECTIONS

30  
↓  
The following questions put the (#) lessons of Worksheet (#) back together in the form you can expect to find on the *University Preparation Programme* Study Guides. Apply what you have learned in these lessons and answer all of the questions. This test should take you \_\_\_\_\_ minutes. Work in your exercise book.

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QUESTION

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1.

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2.

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*NOTE: This is essentially the same format as that of the consolidation exercise.*

*NOTE: Worksheet tests always start on odd-numbered pages. They will usually be one page long. In the event of continuations, proceed to the next odd-numbered page. Repeat the heading WORKSHEET TEST, but eliminate the directions and triple space before starting the questions.*

## Test Answers (4 sp)

13  
↓  
4 sp) ANS WERS

30  
↓  
These are the answers to the Worksheet Test (#). If you had trouble answering a question, go back and revise the lesson(s) which covers the idea.

*In the case of multiple-page tests:*

These are the answers to the first (second, third, etc) page of Worksheet Test (#). If you had trouble ...

3 sp)  
ANSWER 1

*Write the text of the answer here, all the way across the page. If there is a simple numerical answer, put it FIRST, then perform the solution*

(3 sp)  
ANSWER 2

*Text for answers starts one line above the word ANSWER.*

APPENDIX II

Workshop Participant Evaluation Forms A-E

TEACHER EVALUATION FORM A  
CONCEPT DEVELOPMENT WORKSHEETS

*Directions:* Circle the answer that is correct for you.

1. Which CONCEPT DEVELOPMENT WORKSHEET(S) did you examine?

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2. How difficult are these WORKSHEETS in general?

- (a) Very easy
- (b) Easy
- (c) About right
- (d) Difficult
- (e) Very difficult

3. How difficult are these WORKSHEETS for *teachers* and *tutors*?

- (a) Very easy
- (b) Easy
- (c) About right
- (d) Difficult
- (e) Very difficult

4. These WORKSHEETS are designed to primarily cover concepts that are first taught in Standards 9 and 10. Do you think the material in the WORKSHEETS is at the right level?

- (a) The WORKSHEETS are too easy for Standards 9 and 10.
- (b) The WORKSHEETS are about the right level.
- (c) The WORKSHEETS are too difficult for Standards 9 and 10.

5. How many Standard 9 and 10 students could benefit from working through a complete set of Standard 9-10 WORKSHEETS such as these?

- (a) None
- (b) Less than 25%
- (c) 25%-50%
- (d) 50%-75%
- (e) Almost all

6. How *useful* are these WORKSHEETS for students in Standards 9 and 10 *who need help with maths*?

- (a) Very useful
- (b) Somewhat useful
- (c) Not very useful
- (d) Not useful at all

Please continue on the back of this page.

7. How *helpful* are these WORKSHEETS for *teachers*?

- (a) Very helpful
- (b) Somewhat helpful
- (c) Not very helpful
- (d) Not helpful at all

8. How *helpful* are these WORKSHEETS for students as a *supplement* to their work in school?

- (a) Very helpful
- (b) Somewhat helpful
- (c) Not very helpful
- (d) Not helpful at all

9. Recall the University Preparation Programme Study Guides that you examined earlier. Assume that a complete collection of WORKSHEETS were available covering all the material necessary to use the University Preparation Programme Study Guides. *How much more helpful are the Study Guides if the WORKSHEETS are available?*

- (a) WORKSHEETS make University Preparation Programme Study Guides much more helpful.
- (b) WORKSHEETS do not affect the value of the University Preparation Programme Study Guides.
- (c) WORKSHEETS make University Preparation Programme Study Guides less helpful or unnecessary.

10. Assume that WORKSHEETS will be freely available to anybody who wants them. Do you think WORKSHEETS like these should be developed to cover Standards 9 and 10 concepts in maths, science, and English?

- (a) Yes
- (b) Maybe
- (c) No

11. How can these CONCEPT DEVELOPMENT WORKSHEETS be improved?

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12. Open comments:

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*11*

TEACHER EVALUATION FORM C

UNIVERSITY PREPARATION PROGRAMME STUDY GUIDES

*Directions:* Circle the answer that is correct for you.

1. Which University Preparation Programme (UPP) STUDY GUIDE(S) did you examine?

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2. How difficult are these UPP STUDY GUIDES for *students* in general?

- (a) Very easy
- (b) Easy
- (c) About right
- (d) Difficult
- (e) Very difficult

3. Assume a student could complete the UPP STUDY GUIDES correctly. In that case, which of the following would be true?

- (a) The JMB exam would be *very easy* for that student
- (b) The JMB exam would be *easy* for that student
- (c) The JMB exam would still be *difficult* for that student
- (d) The JMB exam would still be *very difficult* for that student
- (e) Impossible to say

4. How difficult are these UPP STUDY GUIDES for *teachers* such as yourself?

- (a) Very easy
- (b) Easy
- (c) About right
- (d) Difficult
- (e) Very Difficult

5. Approximately what proportion of Standard 9 and 10 students will need work in introductory basic skills before they are able to use these UPP STUDY GUIDES?

- (a) None
- (b) Less than 25%
- (c) 25%-50%
- (d) 50%-75%
- (e) Almost all

6. How *useful* are these UPP STUDY GUIDES for *students who are prepared well enough to use them*?

- (a) Very useful
- (b) Somewhat useful
- (c) Not very useful
- (d) Not useful at all

Please continue on the back of this page.

7. How *helpful* are these UPP STUDY GUIDES to *students who are NOT adequately prepared to use them*?

- (a) Very helpful
- (b) Somewhat helpful
- (c) Not very helpful
- (d) Not helpful at all

8. How *helpful* are these UPP STUDY GUIDES to *teachers*?

- (a) Very helpful
- (b) Somewhat helpful
- (c) Not very helpful
- (d) Not helpful at all

9. How can these UPP STUDY GUIDES or this programme be improved?

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10. Open comments:

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STUDENT EVALUATION FORM D

UNIVERSITY PREPARATION PROGRAMME STUDY GUIDES

*Directions:* Circle the answer that is correct for you.

1. Which University Preparation Programme (UPP) STUDY GUIDE(S) did you examine?

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2. How difficult are these UPP STUDY GUIDES for *students* in general?

- (a) Very easy
- (b) Easy
- (c) About right
- (d) Difficult
- (e) Very difficult

3. How difficult did you find this UPP STUDY GUIDE?

- (a) Very easy
- (b) Easy
- (c) About right
- (d) Difficult
- (e) Very difficult

4. Assume a student could complete the UPP STUDY GUIDES correctly. In that case, which of the following would be true?

- (a) The JMB exam would be *very easy* for that student
- (b) The JMB exam would be *easy* for that student
- (c) The JMB exam would still be *difficult* for that student
- (d) The JMB exam would still be *very difficult* for that student
- (e) Impossible to say

5. Approximately what proportion of Standard 9 and 10 students will need work in introductory basic skills before they are able to use these UPP STUDY GUIDES?

- (a) None
- (b) Less than 25%
- (c) 25%-50%
- (d) 50%-75%
- (e) Almost all

6. How *useful* are these UPP STUDY GUIDES for *students who are prepared well enough to use them*?

- (a) Very useful
- (b) Somewhat useful
- (c) Not very useful
- (d) Not useful at all

Please continue on the back of this page.

7. How *helpful* are these UPP STUDY GUIDES to *students who are NOT adequately prepared to use them*?

- (a) Very helpful
- (b) Somewhat helpful
- (c) Not very helpful
- (d) Not helpful at all

8. How *helpful* do you think these UPP STUDY GUIDES will be as a *supplement to instruction in school* at the Standard 9 and 10 level?

- (a) Very helpful
- (b) Somewhat helpful
- (c) Not very helpful
- (d) Not helpful at all

9. How can these UPP STUDY GUIDES or this programme be improved?

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10. Open comments:

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UPP TRAINING WORKSHOP  
PARTICIPANT EVALUATION FORM E

*Directions:* Circle the answer that is correct for you.

1. How much of the material presented in the training workshop *was new* to you?
  - (a) Nearly all
  - (b) Much of it
  - (c) Almost half
  - (d) Not very much
  - (e) Almost none
  
2. How useful is the *approach to tutoring* presented in the training workshop?
  - (a) Very useful
  - (b) Useful
  - (c) Unsure
  - (d) Not very useful
  - (e) Useless
  
3. Please comment below on the usefulness of the particular units in the training workshop. (Mark one for each chapter title.)

CHAPTER	TITLE	VERY USEFUL	USEFUL	NOT VERY USEFUL	NOT USEFUL AT ALL
2	Introduction to Individualized Instruction with Peer Aides				
3	Instructional Procedures with the University Preparation Programme				
4	How to Be an Effective Peer Aide				
5	Task Analysis and Instructional Objectives				
6	Using Task Analysis to Diagnose Student Learning Difficulties				
7	Creating a Positive Learning Atmosphere				
8	Probing Skills and Questioning Techniques				
9	A Strategy to Help Students Solve Problems				
10	Mastery Test Scoring Procedure				
11	Evaluation and the Role of the Resources Aide				

Please continue on the back of this page.

21

4. How *useful* do you feel that this workshop will be to you in your future teaching or tutoring?

- (a) Very useful
- (b) Possibly useful
- (c) Unsure
- (d) Not very useful
- (e) Useless

5. How can this workshop be improved?

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6. Open comments:

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V

APPENDIX III

Responses to the University Preparation Programme  
Workshop Participant Evaluation Form E

### Appendix III

#### Responses to the University Preparation Programme Workshop Participant Evaluation Form E

##### Question 5: How can this workshop be improved?

1. This workshop could be improved by extending the days for training so that the trainees can be well-drilled.
2. This workshop can be improved by the formation of centres in various parts of town. Each centre with a Peer Aid. Example can be at least five centres in Soweto, then every teacher can be in position to learn more without non-formal education.
3. The workshop can be improved only if right of usage of material in it can be opened to outside peers for as long as the extension of the seminar/session.
4. By providing more time and also inviting more people to attend such a workshop.
5. By having follow-ups.
6. There must be a centre established for contact with all who are interested in the non-formal teaching methods. The centre will also extend a hand to various teachers college of education and to teaching at large education departments should be encouraged to recognise these methods.
7. Let it be at the beginning of the year. More people should be invited.
8. By getting more people exposed to the training.
9. By establishing a centre where all the learners should meet, in order to receive a proper guidance.
10. So far I think it should be kept as it is in content and methodology. Perhaps there is need to look at the time factor so as not to make it too much of a crash course.
11. By informing schools within two weeks of notice thereof of the courses to be attended to; as well as assigning the teachers or principals to come and attend for the benefit of the nation.
12. Inclusion of a topic of remedial work for students with learning disabilities.

13. More emphasis and time spent on the actual guides and worksheets and their implementation into a school programme.
14. To relate the training workshop more specifically to the content matter. The workshop will then have to be for one homogenous group (e.g., Physical Science teachers) which might not be very practical.
15. It will have to be modified to cater for a number of students ( $\pm 30$ ) that one peer aide might be involved with in informal education. More time could be spent on going through the guides.
16. More of the pre-planned examples as in videos be shown before the class practising what they have learned.
17. More teachers must be brought and enough time given for each aspect.
18. This workshop can be improved by stressing the practical significance of it in the teaching/learning situation. And while dealing with it, the tutor must actively participate the pupils so that the pupils themselves can feel the need of it in their teaching.
19. It must have guides to supply to teachers for use say one month at least then teachers could comment constructively and accurately.
20. It must always make participants revise what they are expected to do in a seminar.
21. By inviting all the teachers responsible for various subjects not Maths, Physical Science, and English teachers only.
22. If it can stretch almost for a week.
23. All that has been done is cordially satisfying.
24. Hopefully in future other subjects than Maths English and Physical Science should be incorporated in the UPP.
25. More teaching techniques should be demonstrated on the T.V. screen.
26. Study Guides for more subjects should be added.
27. Conducting seminars of this nature and more people invited.

28. It must also use the video-T.V. to demonstrate some of the points otherwise too much talking without variation is boring.
29. By making it more applicable to all the subjects offered in schools. Many teachers should be made aware of this workshop, for them to attend it and acquire more skills.
30. I should suggest that the workshop should see to it that whatever it suggests is practical and applicable to every or all subjects of the school.
31. By inviting teachers from many schools and by involving teachers that are concerned with other subjects, i.e., all subjects offered in Matric. By increasing the number of days for the course.
32. By catering for other subjects as well (e.g., Biology, Geography).
33. So far one has got no idea of how this workshop can be improved.
34. This workshop can be improved by having a training manual especially for languages because as it is, it is too general although it embraces all the aspects fairly well.
35. It would help teachers if the workshop is done over a long period and actual subject matter discussed to help teachers.
36. If we could have a bit more time discussing this useful approach to teaching it would be all the better.
37. We must get more of these educational courses.
38. I feel personally that may only be improved by opening several branches within the country in order to help those schools which you did not be able to consult on your visit and several peoples should be trained to conduct such a job.
39. It looks quite well improved right now.
40. Grouping teachers according to their level of knowledge (which is difficult to do), otherwise somethings are a repetition for some, and this brings in boredom.
41. It can be improved by including upon it more concrete examples and being made more relevant to all subjects.
42. I think it must be given a lot of time so that many people should gain from it. It must not be just once a year.

43. If this workshop could be given an extended time, the topics discussed could have thorough treatment and be related to one another.
44. It can be improved by being made to cater for all subjects for I think all subject teachers need it.
45. This workshop can be improved by adding other subjects not only English and Science subjects.
46. The only area where I feel there could possibly be an improvement is in having more practical application of the techniques demonstrated.
47. Pace at beginning rather slow. Study Guides available at beginning of course.
48. Perhaps using the study guides more.
49. By being more specific.
50. This workshop is excellent.
51. More time for practice.
52. There is a lot of material here; two days are certainly too short to assimilate it all. Sometimes the material seems too technical (i.e., vocabulary), but ideas are excellent. Perhaps simpler presentation for some less experienced teachers. (Some teachers have actually had little or no training!)
53. Shorter sessions over longer periods should involve more teachers.
54. To be open for more teachers.
55. Distribute over a week-long period. Involving more educationists with ideas of self-pacing in order to revue present education system.
56. To spread it over a longer period of time.
57. More emphasis on use of teaching aids (apparatus) in the teaching of these subjects. The language in the training manual is rather formal and could present problems to certain people who are not proficient in English.
58. I think there should be separate workshops for the three groups. Maths, Science, English so more time can be spent on their respective problems.

59. By having the workshop spread over more days with fewer hours per day.
60. Very useful.
61. I feel we should keep on being contacted to be encouraged to implement our theoretical knowledge.
62. It is not important how I came, but I am happy I was able to get this exposure. I only hope contact will be maintained otherwise this will end up two days wasted.  
  
Thank you Ndiyabuela - I wish our you (Xhosa) were also plural.
63. It becomes almost waste of manpower when such good (lecturers) (methods) of teaching are only delivered to a minority, as it will take time for the skills to diffuse to most people in the country.
64. The feeling is this that non-formal education project can be extended to formal and informal education.
65. I found that there is still a lot of work to be done in a non-formal setting in South Africa. It could be all right if the lower classes could be accommodated in these materials.
66. Everything is really excellent and interesting.

Question 6: Open Comments

1. It is crucial to have a follow-up to chase up these participants after three months perhaps?
2. It will be very much useful if this can be repeatedly trained. Learners must have clear guidance from Peer Aides.
3. It makes teaching easier, more rewarding to both teacher and student. The student would be rewarded by suddenly finding him/herself coping and improving chances of passing, which in turn would reward the teacher.
4. This work shop has assisted me to look into Peer and Peer Aide communication and encourage the peer aides to sort of create a more friendly two-way stream.
5. To actually fully implement a self-study type programme in schools, requires very careful planning and preparation by the teacher, taking into account, the practical situation in the school, etc., and also guidance to pupils using these

methods. There is also a need to differentiate in degree of difficulty, quantity, etc., for the brighter and the slower students. How does one avoid dishonesty, copying from other students, effectively in such a programme? 400-1st year potential teachers. 2-Science students teachers.

6. Very effective way of giving information.
7. Number of students-124. The workshop has been more useful to teachers in high schools and prospective teachers their own teaching and in understanding these concepts they deal with.
8. No. of students-80.
9. I have 180 Standard 8 Maths students.
10. 82 in one, 61 in another and 49 = 162 pupils.
11. 200 Standard 7 and 120 Standard 9.
12. 258 students.
13. 65
14. Three sections-175 Standard 8. Two sections-120 Standard 9.
15. 250 students. The terms are new to me, e.g., probing, etc. Therefore, I still have to study the material thoroughly over again, and refer to what has been done in this workshop. I am slow by nature.
16. 150 pupils.
17.  $\pm 160$
18. Six sections: A = 34, B = 30, C = 35, D = 40, E = 42, F = 39.
19. The way questions were asked during the first day, didn't please me. I think it's better to let people contribute voluntarily to a question than to point them to contribute. Point is equivalent to forcing people.
20. 150
21. 55
22. 185
23.  $\pm 150$

24. 5 sections: A = 50, B = 52, C = 49, D = 52, E = 54
25. 185 students. Where a teacher teaches more than one section of the same class, it is impossible to cater for the needs of an individual pupil. Teachers rely on tests for the evaluation of the pupils work.
26. Standard 10: 280. Standard 7: a = 40, b = 60, c = 36, d = 64.
27. 250
28. 207
29. Form IV class is Standard 9 -- 470 students at the beginning of the year and 14 girls went out because of a pregnancy while about 7 left the school because of financial difficulties so many students are lost per year because of financial reasons.
30. 248
31. 200 students. I enjoyed Chapters 5 and 8 mostly 8. It's going to be useful for my type of job.
32. 150 pupils for English and almost the whole school (700) for Guidance.
33. 88
34. 137
35. 53
36. This workshop has opened many avenues which had been closed to me. For instance, Chapter 5, I always assumed that the students at Standard 10 knew all the basic skills but the chapter has proved the opposite.
37. The workshop could be conducted at a time more convenient for teachers. Possibly during a vacation. I found the final session rather strenuous, perhaps as a result of over-concentration. The study guides could be improved upon, printing-wise. I found it difficult to read the small print.
38. Chapter 9 interesting on techniques of problem solving but becomes too specific too soon. Therefore, not able to be adapted to other problems of a nonscientific nature.
39. Valuable for preparing programmes. It indicates how difficult it is.

40. It was a very good workshop.
41. Whole training programme and set of study guides are urgently needed here. Keep it up.
42. Very interesting. Your methods are great.
43. I think its useful and for me it did a great deal to enrich my knowledge about certain methods.
44. I wish to express my appreciation to the organisers who were concerned with the whole project, for the opportunity to learn and being able to apply the knowledge gained in our own learning situation.
45. I felt that the demonstration of the techniques by using them on us was very effective. I would like the demonstrators to indicate how they hope to see these techniques implemented in the system that we have at the moment. It would also be interesting to have feed back from all those present so that one could know what they've attempted, what worked and what were the problems encountered.
46. This is the first time that I have attended a workshop of this nature and it has inspired me to improve the students' learning skills.
47. Here a feeling that workshops of this nature could be very helpful if more people from various education boards in the country could be invited to attend and at some stage the arrangement with the students concerned set up, if possible.
48. This kind of workshop is important in our black teachers and putting in on a wider scope could be very useful, that is involving a large number of teachers in the townships could be a help to the students. Therefore, organising in the schools is recommended.
49. The workshops in the future should be held when it is possible for more people to attend. Transport is another difficulty that needs to be investigated.

**APPENDIX IV**

**Responses to Teacher Evaluation Form C  
University Preparation Programme Study Guides**

## Appendix IV

### Responses to Teacher Evaluation Form C University Preparation Programme Study Guides

#### Question 9: How can these UPP Study Guides or this programme be improved?

1. If they can be designed in conjunction with the syllabus concerned.
2. By having worksheets to work some problems on preferably with time limit.
3. By providing this kind of programme to more people than is the case presently. Offering them at the beginning of the year.
4. By providing worksheets for students to work on.
5. By having working sheets accompanying them for students to apply their knowledge.
6. By having worksheets to be used with the study guide.
7. These UPP STUDY GUIDES can be improved if the introductory page or section can be simplified or broken into understandable sections, for the benefit of the powerful and weak learner.
8. By giving more exercises for students, even from the guides, before an attempt is made on the exercises from books stated for reference.
9. One will be able to say after application.
10. My evaluation is that this programme is all right for students who have an overview of the syllabus (i.e., Matric) or can be used by students who are been prepared for university entrances. This programme can be improved by restructuring the workbook to accomodate students who are in Standard 9 and 10. I recommend that if some more steps could be shown in solutions of examples. The typing could be improved.
11. This programme can be improved by starting from simple to complex. Giving simple examples which will encourage students to know further because they would be able to get more information on their own.

12. Teachers should be allowed to pinpoint some difficulties or problems they encounter using these, so that weaknesses in these guides which, of course, aren't intentional, may be attended to.
13. They must be constructed in such a way that even those who are not adequately prepared can easily use them.
14. They may be improved by covering the whole syllabus.
15. This programme can be improved if all sections in the Mathematics can be shown in the guide not only specific sections in mathematics.
16. I think with a little more clarification on some of the aspects, the UPP Study Guides can be very helpful to both the teachers and the student. Again, they bridge the gap between the student and the teacher.
17. The study guides can be improved by changing the matter they contain after a certain period of time.
18. The guide could give more instructions or directions to pupils as to what they should do, e.g., read through, work out, etc.
19. This study guide can be improved by adding more problems.
20. More problems needed.
21. It should consider that in the African education, there are less qualified science teachers in the secondary education, it should therefore have some introductory concepts to the pupils who did not have enough basic in Standard 8 but in case of the students who had scientific basics, they are generally more helpful.
22. I think they are suitable for J.M.B. students.
23. Not much after quickly going through it. Improvements could be implemented after careful use of the guides.
24. These UPP STUDY GUIDES seem well-improved and nothing more should be added or removed.
25. I think they are right for a start since most of the schools have never been exposed to such learning techniques.
26. By giving more samples of items and their solutions and more mastery test items.

27. Some of the examples in informal language are too American. Try and get examples of informal language spoken around this country.
28. Even if it is very difficult, I think the programme could suggest some "general guidelines" in attempting and solving geometry questions on area proportion and similarity.
29. I think the "UPP Study Guides," especially the mathematics ones, should have more examples of various types of problems in every subsection.
30. Should have more problems to be worked out by learners since the textbooks do not motivate learners much in geometry since they do not provide answers for learners. So the learner works out the problem and there is no guide as to whether he has mastered the problems.
31. They can be improved by being used taking into account what is required by the syllabus.
32. The period for the programme can be made longer.
33. Real try-out in the real classroom situation would be the best thing.
34. More examples on each section should be made.
35. Larger, clearer print. Great care need in level of vocabulary used as most of the pupils are not English speaking.
36. By studying syllabus and examination requirements.
37. More problems could be included.
38. Should be supplemental with audio/visual aides.
39. I don't see the need to improve these programmes. After working through them the average English first language student should have a considerable basis to answer similar questions.
40. Using simpler English terms, e.g., strategies.
41. They can be improved by giving difficult theorems together with their applications.
42. I feel that some revision problems could be added at the end of the guide.

43. Give small summary of chapter as well as one or two examples. Then problems. At the back of the book you can get the solution as well as a brief discussion on it.
44. The guides, I believe they are helpful in the sense that an enlightened student can care to understand what is in the guide. For example, If a student is well taught, then the guide is beneficial to such a learner.
45. These student guides could even be given out to the students earlier in the year for students to use them in preparing for their monthly tests.
46. Most useful.
47. My judgement is based on my previous experience of matric maths, not on my experience as maths teacher.

#### Question 10: Open Comments

1. The feelings of the teachers are too individual. The improvement methods for South Africa are increasingly becoming too diverse. This one I am in favour of like REA, Shel library project, but I need time to improve my qualifications without having to attend diverse seminars, that will seemingly take most of my time for part-time studies and which the South African government does not readily recognise salary-wise.
2. JMB exams is more difficult for Blacks children. As far as maths is concerned, I suggest that they should stick to National Senior Exam.
3. It is quite a leap to expose people from a rigid system, especially when even financially they are dependant on that system to a project such as this. But I am the last person who would say this is futile because a start has to be established and under the present circumstances this is good.
4. More study guides in different subjects must be available for use by pupils.
5. I think the solution of problems or item types can lead students to rote learning and they can memorize the proof without actually understanding why is that so.

9/1

6. I think we must use Study Guides which correlate with the National Senior Certificate rather than J.M.B. because our students are doing N.S.C.
7. On the whole this project is good but at a later stage; other sections must be included.
8. The Seminar has helped a lot in reminding the teachers (especially) that they should do as little talking as possible. Education must be learner centered, and this should be kept in mind by all teachers. "Let the child discover."
9. Organised seminar for the future will be greatly appreciated and probably more people will attend them -- especially when we have informed them about their benefits.
10. The guide seems to be useful in giving teachers and students ways of approaching problems.
11. In my opinion, I would suggest that since I consider the programme to be of primary importance, I should be having a branch in South Africa who will go all round the country particularly to black schools to teach teachers how to teach science. This I say because I have encountered a situation of where in many schools science is taught by almost all unqualified teachers. I think you should train blacks in all universities say (4 students) to undergo this project under your supervision and consult them time and again to ensure that the effective progress is continued in almost all black schools in South Africa.
12. These guides could also be very helpful to the teachers.
13. These study guides are very good except for few improvements that are necessary if any.
14. Since our teaching (i.e., in this part of the country) still is examination-oriented, in solutions of maths problems mark allocation could be involved so as to guide teachers and students.
15. These can be very much of help to our pupils since they do not have the exact way of tackling their exam problems as they are never sure. These guides promote self-confidence of any student in the subject and everything may become easier.
16. The use of the study guides will be quite beneficial. The English guides should lay emphasis on how the pupils express themselves as language is a drawback in the mastery of concepts.

93

17. These guides are OK for individual instruction, but I have my doubts whether they'll work OK with a class of 60 which can only be broken into groups of 10-12 members in each group.
18. Constructions like: Find by construction  $n$  if  $n = \sqrt{70.50}$  etc., could be included.
19. This offers good guidance to teachers as well as students if only they could be followed sincerely.
20. Study guides are helpful.
21. These guides should be made available for usage at school.
22. Vectors have magnitude and direction, which must also be measured and/or calculated. Programme can only be used as revision, in close conjunction with the relevant texts, once the basic content knowledge, etc., has been presented.
23. This UPP is very helpful only if there can be enough time for its conduction.
24. The study guides would be improved with feedback information from classroom experiences. Otherwise no apparent shortcomings. What about axioms in geometry? A brief introduction to proof as well.
25. Well organised; good worked examples, but some words used in the text are too advanced for the average student for who this text is intended, e.g., strategies, reflexivity, transitivity. Possibly the print is too small to capture immediate interest.
26. Good way of summarising work in Standard 9 and 10 syllabus.
27. More study guides should be made available to students. It's the first time I see or hear about them.
28. Because the students have to work independently, they would need to have mastered basic skills of comprehension, etc.
29. I wonder if more examples can be added or are they contained in the "References?" If so, they are concealed.
30. Points 2.4 and 5 is difficult to answer not being a Maths teacher.
31. Some students will not understand terms like strategy used in the study guide.

32. These study aids are very important in that they only deal with the most important material of the text and leave much of the explaining to the textbook and the teacher.
33. This is a good summary of the area, proportion and similarity theorems which supplements the learning material especially on the strategy of tackling certain problems.
34. I think that the book gives us a small summary of what the Standard 10 syllabus wants. Brief discussion on some problems could fill it up.
35. This UPP study guides are very good. A student who work through this book will be able to pass the JMB examination.
36. It is difficult to say if the UPP Study Guides will be useful to pupils. It entirely depends on the method used by the teacher.

APPENDIX V

Responses to Teacher Evaluation Form A  
University Preparation Programme Concept Development Worksheets

## Appendix V

### Responses to Teacher Evaluation Form A University Preparation Programme Concept Development Worksheets

#### Question 11: How can these Concept Development Worksheets be improved?

1. I think it is only after one has applied these that one can give suggestions.
2. For this purpose, I think it's not so necessary to start from the basics, there's too much drilling about the chord, secant, etc.
3. They are superb, more especially when a student is using individualised instructions (not formal).
4. If effectively used, they are going to be beneficial.
5. If the student makes the best use of them, they are quite adequate.
6. Depending on the effective use of the worksheet and proper supervision does not need improving.
7. By giving more exercises in the guides before some students can attempt exercises or stated from books of reference.
8. Clear and direct. The lay out and presentation very pleasant for this "ominous" subject. There is an atmosphere of "it can be done."
9. Need a lot of consideration and study before comment.
10. As far as Matric is concerned, these guides will be very useful in preparing a student for the Matric examination.
11. Not much at the moment; may be after use.
12. Concept Development Worksheets can be improved by including other sections in mathematics.
13. It must cover the whole syllabus.
14. These are really detailed worksheets with little room for improvement. It might even be too detailed.
15. They define concepts clearly.

16. I think as they cover the work that is supposed to be done, they are okay, with a little simplification here and there.
17. They should have tutorial problems.
18. They should go along with the syllabus which changes after some years.
19. They can be improved by having the material which is at the actual level of Standard 9 and 10 students and work on material that is also in the syllabus. Otherwise these worksheets will benefit some of the dull students.
20. Less content concerning Standard 8 work should be included.
21. By using a different arrangement of the questions and the solutions. Preferably, solutions should be given right after each set of questions rather than at the bottom, since some may be in different pages for the same set.
22. A student could be confused by the way the worksheet is arranged so that could be improved. Getting the definition three pages from the one that has a question so the child may be bored to seek for the answer.
23. For Science, they would have to include many applications, examples and problems on each topic to give the necessary practice - factual knowledge and especially calculations.
24. The worksheets need not cover a small portion of Matric syllabus but they should cover nearly all the concepts.
25. Well organised, very useful, but more durable cover is needed!
26. It is done quite well.
27. The problems at the end could be made more involved.
28. Good enough.
29. They are in order.
30. Knowing the kind of student you have in your class, you can cater for a wider spectrum be it fundamental or advanced.
31. Hard cover to last longer, otherwise good.
32. First, by binding them with a harder cover so that they can last for a longer time since they are useful. Use simpler terms.

Question 12: Open Comments

1. There is a crying need that from the beginning education be oriented so that students can work on their own. Otherwise helpful aids like this one can be said to be useless and in fact be useless when given to unprepared students.
2. If these can be used effectively by the teacher and the group then pupils would grasp the concepts easily.
3. This was what I was looking forward to. I anticipate a lot of improvements from these guides.
4. It would be advisable to introduce the study aids earlier in the year. The study guide is o.k.
5. Most useful.
6. Pupils and Peer Aides should guard against thinking that the worksheet is the syllabus laid down by the Education Department.
7. This worksheet is basically handy for it is understandable and direct. At a first glance a student can be on the know of [what] is expected of him or her.
8. Barry and Peter tell me this work book is good - you know my problem.
9. The worksheet is very useful, but it will take some time to put them into practice effectively in a school situation where one teaches a class for the first time in std. 10.
10. I am not in a position to answer No. 9 because I am not clear and/or familiar with the content of this worksheets and maths curriculum at university level.
11. The worksheets seem to help Standards 8 and 9 and neglect Standard 10.
12. These worksheets could also be very helpful to students.
13. I feel these study guides should be sold to teachers at the beginning of the year so that the teachers can teach in relation to these study guides which then will help pupils when they get hold of these to find no difficulty in working with them.

14. Possibly also we could differentiate in the degree of difficulty of questions, problems for use by HG and SG pupils. Also include "challenge" problems to stimulate thought, own interpretations, views, ideas, etc. For example, open-ended questions, without a given "model" answer.
15. The worksheets need not only require one-word answers, but they should include some problems which should be solved.
16. The university maths is basically continued on calculus and Algebra, most especially in this university, no geometry is needed at all. These guides will only assist during the Matric examination preparation, and just as a basic of mathematics towards a university education.
17. Assuming that all previous work has been covered and well understood, this worksheet is very well structured. I feel however, that this is not the case and worksheets should be developed for lower Standards too.
18. Care needed in selection of vocabulary. I wonder if all students would understand, e.g., overlapping, intersect, relationship, hypothesis, adjacent, converse. Perhaps such words should be defined when first used, or in a glossary.
19. The care and thoughtfulness with which these have been prepared will eradicate most of the content problems which pupils encounter in Maths.
20. Should be freely available.
21. I like it.
22. Should be made freely available to students preparing for Matric exams.
23. They are very helpful even to those students who cannot retain what they have learnt. Especially to those who did not grasp the basic concepts in Standard 8.
24. These worksheets are excellent and should benefit teacher and pupils in their study of maths.
25. Should be translated into Afrikaans.
26. The questions are of a very good standard. All students will benefit by working through some questions.
27. Overall, I think this guide is excellent. It was also a good idea to include a lesson on "What is proof."

APPENDIX VI  
Training Workshop Attendees

## Appendix VI

### Training Workshop Attendees

#### Johannesburg

Orriel Bamuza  
Joyce Buku  
Vusumuzi Lamga  
T.J. Madiba  
Nontutuzelo Majombozi  
Sibusiso Manquele  
Hasani Maphophe  
Peter Maroo  
Barry Masoga  
Lizeka Mnduzulwana  
Nontombi Mngomezulu  
Martina Mogolane  
Bernadette Mosala  
Caiphus Mphahele

#### University of Zululand (con't)

S.V. Mthethwa  
B. Ndimande  
V.N. Ndwande  
V.V. Ngcobo  
C.J. Ngubane  
R.M. Njisane  
P.B. Nkosi  
B. Nkwanyana  
A.T. Nzama  
A.M. Shezi  
P.D.G. Stein  
P.S. Thabethe  
M.N.M. Zibani  
T.H.C. Zimu

#### University of Zululand

H.P. Bhengu  
T.P. Bokako  
V.M. Brits  
S. Cele  
N.J.L. Dluda  
E.T. Dube  
F.B.T. Gombela  
T.R. Guma  
N.B. Jiyane  
D.L. Kunene  
D.V. Luthuli  
E.V. Madondo  
N.V. Magi  
R.M. Maruma  
S.K. Mathabela  
M.M. Mathe  
Mdudzi/Selwyn Mayisela  
L.M. Mbambo  
Y.S. Mbhele  
M.D. Mchunu  
S.M. Mhlongo  
T.V. Mkhize  
S.Q. Mkhwamazi  
Sebe Mngomezulu  
T.N. Mnisi  
B.R. Mnyabiso  
Isabel Mthethwa

#### Cape Town

M.A. Abrahams  
Daniel Bailey  
Helen Campbell  
Janet Davies  
Isgaak Ebrahim  
J.J.C. Eiman  
R. Fray  
Terence Hillburgh  
Anthony Jacobs  
Lewis Jonuer  
N.P. Mandla  
Monde Mbekwa  
V.F. Mdleleni  
J. Morgan  
V.A. Ndengezi  
Noxolo Ndlumbini  
Maduray Reddy  
Linda Rose  
Franklin Shand  
G. Thorburn