ADVISORY COMMITTEE ON MATHEMATICS REPORT

REFLECTION ON THE STATUS OF STRUCTURED IN-SERVICE TRAINING PROGRAMMES FOR IN-SERVICE SECONDARY SCHOOL MATHEMATICS TEACHERS IN SA

1. INTRODUCTION

The South African Mathematics Foundation has initiated a project to determine the status of formal in-service training programmes for in-service mathematics educators at South African High Schools. This study specifically targeted short courses on offer. Formal programmes, such as the B.Ed. (Hons.), which arguably constitute in-service training when taken on a part-time basis, were not considered.

It is common cause that the state of training of high school Mathematics teachers is generally poor throughout the country. It was therefore deemed necessary to assess what is being done in the way of informal upgrading of teachers, in order to devise strategies to improve the situation. The survey was conducted with limited capacity to do justice to a broad based review of current in-service teacher training activities that could be valuable in the context of the main aim of this report. Thus this study should be viewed as a first step in what could be a lengthy and much more costly process of determining the full extent of in-service professional training opportunities that exist country-wide.

2. METHODOLOGY AND RESPONSE

Considering a range of aspects that should ideally be part and parcel of the ongoing professional development of mathematics teachers in the 21st century, a structured survey template was designed to serve as a basis for reflecting and reporting on by current HE institutions or NGO's that are involved in in-service skills training of mathematics educators . The areas that were included in the survey are reflected as annexures to this report.

Attempts were made to contact Education Faculties at all South African Universities, with a view to identifying the right contact people to assist with the survey. Once this was done, questionnaires were sent to these people in order to capture information concerning the programmes they offered. Responses were not good. Completed questionnaires have been received from just six institutions, namely NMMU, the Universities of Cape Town, Stellenbosch and Witwatersrand, North-West and AIMESEC. In addition, three Universities advised that they do not currently offer programs of this type. These are the University of Kwazulu-Natal, Walter Sisulu University and the Cape Peninsula University of Technology. A number of known NGO organizations that traditionally were engaged in the mathematics skills upgrade of teachers were also contacted for information about the programmes that they may be offering.

3. SUMMARY OF RESPONSES

We give brief summaries of the activities of the six institutions which submitted completed questionnaires.

3.1 **University of Cape Town** (Annexures 1-8)

UCT offers an Advanced Certificate in **Senior Phase Mathematics** Teaching. This programme is taken over two years, and has a weighting of 120 SAQA credits at Level 6. Students are exposed to an extensive range of topics in the Senior Phase curriculum. In addition, there are a number of shorter programmes at the same level, namely:

- Teaching strategies for numbers, operations, and relationships in senior phase (12 hours, NQF level 6, 2 credits)
- Assessment principles and strategies for senior phase mathematics and science teachers (12 hours, NQF level 6, 2 credits)
- Developing the concept of function from patterns for senior phase teachers (6 hours, NQF level 6, 2 credits)
- Designing geometry classroom activities (6-12 hours, NQF level 6, 1-2 credits)
- Lines angles and constructions for senior phase (6 hours, NQF level 6, 2 credits)
- Engaging with number for senior phase teachers (6 hours, NQF level 6, 2 credits)
- Probability for CAPS content for senior phase (6 hours, NQF level 6, 1-2 credits)

The number of times these programmes have been offered over the past three years ranges between 2 and 5.

3.2 **University of Stellenbosch** (Annexures 9-11)

The University of Stellenbosch reported on programmes offered at three different centres in the Western Cape and Northern Cape. All of these run over a six-month period and they appear to be very similar. They cover a wide range of topics contained in the **Senior Phase curriculum**. None of them appears to have SAQA accreditation at present.

3.3 **University of the Witwatersrand** (Annexure 12)

Wits reported on a project entitled “Wits Maths Connect Secondary Project”, which aims to upgrade mathematics teachers generally and in particular to equip them to assist learners to make the transitions from Grade 9 to Grade 10, and from Grade 12 to University. The programme runs over a full year, and participating teachers are required to devote a number of full days to attending classes. The programe consists of two sections, entitled “Transition Maths 1” and “Transition Maths 2”. It is not SAQA accredited at present.

3.4 **AIMSEC** (Annexure 13)

AIMSEC reported on a two-year Advanced Certificate in Education (ACE) programme which is currently accredited by the University of Fort Hare. This is a comprehensive programme, with contact sessions and Video conferencing. This will shortly be replaced by the new ACT course, with accreditation being taken over by the University of the Northwest. There is also a mathematics teacher short course that is offered over a three months duration. These target unqualified and under-qualified mathematics teachers with the view of upgrading.

3.5 **GMMDU at Nelson Mandela Metropolitan University** (Annexures 14-15)

The Govan Mbeki Mathematics Development Unit at the NMMU reported on two programmes that are aimed at addressing the skills development needs of in-service Mathematics teachers at the FET level. The first one is an accredited programme that focusses on Grade 11 & 12 content across the CAPS curriculum and is delivered as two short learning programmes (six-

months each). The delivery mode of the mathematics skills development programme (MATHSUP) is a semi-distance basis with nine contact days of structure face-to-face instruction for each SLP. Both formal and informal assessments form part of the programme and each SLP is concluded with the writing of a paper-based 3-hour examination. A laptop, calculator and a comprehensive set of digital support material, that is CAPS aligned, is distributed to each teacher who register for the programme. A techno-blended approach is followed and training also include some relevant content pedagogy and ICT skills development (GeoGebra for example) in the context of the delivery of the CAPS curriculum in classrooms.

The MATHSUP programme for educators were successfully delivered to more than 500 in-service teachers in the Eastern Cape and Free State Provinces over the past three years.

The GMMDU also reported on a structured GeoGebra certification programme for beginner-users that was offered to in-service mathematics teachers at secondary school level. The programme teaches the utilization of GeoGebra to strengthen the T&L of key concepts and results through dynamic visualization and multiple representation. Four key areas of the CAPS curriculum are covered. This short learning programme runs over six months and is in the process of being registered with SACE.

3.6 **North-West University** (Annexures 16-19)

Northwest university reported on three short learning programmes, which, respectively, targets Foundation Phase, Intermediate and Senior Phase and FET educators. These are of 3 days duration and were introduced in 2014/5. They also run one day colloquia for teachers at three-monthly intervals.

4. CONCLUSION

Given the amount of time and energy that was spent to initiate, implement and follow-up on responses to the teacher training survey, one can only conclude that there seems to be very few structured professional development training programmes that are actively supporting in-service mathematics teachers to cope with a range of challenges that exist in secondary schools. The responses suggest that more in-service support programmes exist to support Senior Phase than for the FET phase. Both the scope and the nature of existing programmes seems to be totally un-coordinated and not always aligned with key aspects of the national MST development plan of the DoBE. Even the South African Council of Educators, which is the custodian of professional skills development of teachers in SA, seems to have a very limited database of potential service providers and structured programmes to cover the broad spectrum of skills demands that currently exist in the mathematics education profession at secondary school level. Much work is needed to ascertain the true capacity, expertise and experience that exist in provinces to assist with the mammoth task of improving the content knowledge, content pedagogy, ICT- and other related professional skills of in-service mathematics teachers in this country. The ACM strongly support the proposal that SAMF arrange a 2-day seminar in 2016 to give all respondents to this survey and other key stakeholders that opportunity to share more practical information about the existing professional development programmes for in-service FET mathematics teachers and to conceptualize possible strategies to profile generic priority focus areas of such programmes.

Annexure 1

Mathematics Skills Development Programme (MSDP) Survey

Name of Programme: Advanced Certificate in Senior Phase Teaching - Mathematics Teaching

Programme Leader(s): Roger MacKay

021 650 5622 (office)

roger.mackay@uct.ac.za

Programme History: (number of previous offerings) Previously ACE; the ACT current began in 2014

Programme Duration: 2 years

Current Programme Accreditation: (if applicable) UCT accreditation

Credits: **Total: 120**

NQF Level 6: 120

Main Beneficiaries: Senior phase teachers

Short Programme Description: Adv Cert (SP Teaching) - Mathematics Teaching

If programme brochure, study guide or information document is available in electronic format, please send a copy to waolivier@nmmu.ac.za

Survey on Nature of Mathematics Teacher Development Programme:

Please check ✓ the box(es) that is directly applicable to your Maths development programme.

Please provide relevant comments with each item if applicable.

Profiling of Mathematics Existing Teacher Development Programme					COMMENTS
A. Content Knowledge Skills and Perspectives	***Learning Outcomes per Grade Level***	Please Select (✓) the Content Areas and indicate the Grade Level that applies to your programme		Grade Level (e.g. 11-12)	
		FUNCTIONS	✓	7-10	
		NUMBER PATTERNS, SEQUENCES AND SERIES	✓	7-10	
		FINANCE, GROWTH AND DECAY	✓	7-10	
		ALGEBRA	✓	7-10	
		DIFFERENTIAL CALCULUS			
		PROBABILITY	✓	7-10	
		EUCLIDEAN GEOMETRY & MEASUREMENT	✓	7-10	
		TRIGONOMETRY			
		ANALYTICAL GEOMETRY			
		STATISTICS	✓	7-10	
		OTHER AREA(S)			

	Skills	Please indicate which Maths skills are aimed for in your programme		
		Conceptual Understanding	✓	
		Procedures & Mathematical Manipulations	✓	
		Problem Solving Strategies	✓	
	Perspectives	Please indicate which aspects of Maths are being promoted		
		Real Life Applications	✓	
		Value of Maths in Society	?	
	Curriculum alignment	Indicate relevant characteristics of your Maths programme content.		
		CAPS aligned	✓	
		General content topics in Maths		
		Revision based content		
B. Assesment	***School Based***	Which aspects of assessment are integrated in your programme.		
		Setting of Tests	✓	
		Setting of Exams	✓	
		Homework strategies		
	Extra-school	Assignments	✓	
		Group based assessment		
C. Teaching & Learning	***Pedagogical Skills***	Please select aspects of pedagogy that are included.		
		How, When, What to teach	✓	
		Classroom activities	✓	
		Assessment skills	✓	
	Technological Skills	Which pedagogy aspects are included in your Maths programme?		
		Scientific calculator skills	✓	
		Computer & admin software skills.		
		Mathematical software skills (e.g. GeoGebra)	✓	
		Data projection / presentation skills		
		Internet skills	✓	

	Learners' learning needs	Please indicate if the programme teaching promote the following:		
		Learner-centred methods	✓	
		Knowledge of self-directed learning	✓	
D. Support	***Teaching & Learning Materials***	Please indicate which training materials are distributed.		
		Textbooks, notes in hardcopy format	✓	
		Digital resource material	✓	
		Revision/practice material in hard copy format	✓	
	Technical Support	Please indicate the nature of technical support provided.		
		Equipment like calculators, laptops, tablets	✓	
		Internet access and navigation	✓	
		Access to Learning Management Systems	✓	
	Learning community	Please indicate if group work forms part of the training programme.		
		Group work during training		
E. Follow up	***Academic coherence and continuity***	Please indicate whether the programme sessions articulate with with each other or with other existing programmes which are similar.		
		Articulation exist between successive training sessions or with other similar programmes		
		Academic themes of training sessions are mutually supportive		
		Accumulation of skills and knowledge across the programme is progressive	✓	
	QA strategies	Please indicate whether the following elements are in place:		
		Opportunities for reflection during training	✓	
		Post programme feedback survey(s) is conducted		
		Progress of teachers are monitored and measured		
	Impact indicators	Feedback on impact is disseminated to stakeholders		

Thank you very much for completing this survey!

Annexure 2

Mathematics Skills Development Programme (MSDP) Survey

Name of Programme: **teaching strategies for numbers, operations, and relationships in senior phase**

Programme Leader(s): **Roger MacKay**

021 650 5622 (office)

roger.mackay@uct.ac.za

Programme History: (number of previous offerings) 2 times previously

Programme Duration: 12 hours

Current Programme Accreditation: (if applicable) UCT accreditation

Credits: **Total: 2 credits**

NQF Level 6

Main Beneficiaries: Senior phase teachers

Short Programme Description:

If programme brochure, study guide or information document is available in electronic format, please send a copy to waolivier@nmmu.ac.za

Survey on Nature of Mathematics Teacher Development Programme:

Please check ✓ the box(es) that is directly applicable to your Maths development programme.

Please provide relevant comments with each item if applicable.

Profiling of Mathematics Existing Teacher Development Programme					**COMMENTS**
F. Content Knowledge Skills and Perspectives	***Learning Outcomes per Grade Level***	Please Select (✓) the Content Areas and indicate the Grade Level that applies to your programme		Grade Level (e.g. 11-12)	
		FUNCTIONS	✓	7-9	
		NUMBER PATTERNS, SEQUENCES AND SERIES	✓	7-9	
		FINANCE, GROWTH AND DECAY			
		ALGEBRA	✓	7-9	
		DIFFERENTIAL CALCULUS			
		PROBABILITY			
		EUCLIDEAN GEOMETRY & MEASUREMENT			
		TRIGONOMETRY			
		ANALYTICAL GEOMETRY			
		STATISTICS			
		OTHER AREA(S) NUMBER			

	Skills	Please indicate which Maths skills are aimed for in your programme	
		Conceptual Understanding ✓	
		Procedures & Mathematical Manipulations ✓	
		Problem Solving Strategies ✓	
	Perspectives	Please indicate which aspects of Maths are being promoted	
		Real Life Applications	
		Value of Maths in Society	
	Curriculum alignment	Indicate relevant characteristics of your Maths programme content.	
		CAPS aligned ✓	
		General content topics in Maths	
		Revision based content	
G. Assesment	***School Based***	Which aspects of assessment are integrated in your programme.	
		Setting of Tests ✓	
		Setting of Exams	
		Homework strategies	
	Extra-school	Assignments ✓	
		Group based assessment	
H. Teaching & Learning	***Pedagogical Skills***	Please select aspects of pedagogy that are included.	
		How, When, What to teach ✓	
		Classroom activities ✓	
		Assessment skills ✓	
	Technological Skills	Which pedagogy aspects are included in your Maths programme?	
		Scientific calculator skills	
		Computer & admin software skills.	
		Mathematical software skills (e.g. GeoGebra)	
		Data projection / presentation skills	
		Internet skills	

	Learners' learning needs	Please indicate if the programme teaching promote the following:		
		Learner-centred methods	✓	
		Knowledge of self-directed learning	✓	
I. Support	***Teaching & Learning Materials***	Please indicate which training materials are distributed.		
		Textbooks, notes in hardcopy format	✓	
		Digital resource material	✓	
		Revision/practice material in hard copy format	✓	
	Technical Support	Please indicate the nature of technical support provided.		
		Equipment like calculators, laptops, tablets		
		Internet access and navigation		
		Access to Learning Management Systems		
	Learning community	Please indicate if group work forms part of the training programme.		
		Group work during training		
J. Follow up	***Academic coherence and continuity***	Please indicate whether the programme sessions articulate with with each other or with other existing programmes which are similar.		
		Articulation exist between successive training sessions or with other similar programmes		
		Academic themes of training sessions are mutually supportive		
		Accumulation of skills and knowledge across the programme is progressive		
	QA strategies	Please indicate whether the following elements are in place:		
		Opportunities for reflection during training	✓	
		Post programme feedback survey(s) is conducted		
		Progress of teachers are monitored and measured		
	Impact indicators	Feedback on impact is disseminated to stakeholders		

Thank you very much for completing this survey!

Annexure 3

Mathematics Skills Development Programme (MSDP) Survey

Name of Programme: **Assessment principles and strategies for senior phase mathematics and science teachers**

Programme Leader(s): **Anthea Roberts**

021 650 3851 (office)

anthea.roberts@uct.ac.za

Programme History: (number of previous offerings) twice previously

Programme Duration: 12 hours

Current Programme Accreditation: (if applicable) UCT accreditation

Credits: **Total: 2 credits**

NQF Level 6

Main Beneficiaries: Senior phase teachers

Short Programme Description:

If programme brochure, study guide or information document is available in electronic format, please send a copy to waolivier@nmmu.ac.za

Survey on Nature of Mathematics Teacher Development Programme:

Please check ✓ the box(es) that is directly applicable to your Maths development programme.

Please provide relevant comments with each item if applicable.

Profiling of Mathematics Existing Teacher Development Programme					**COMMENTS**
K. Content Knowledge Skills and Perspectives	***Learning Outcomes per Grade Level***	Please Select (✓) the Content Areas and indicate the Grade Level that applies to your programme		Grade Level (e.g. 11-12)	
		FUNCTIONS			
		NUMBER PATTERNS, SEQUENCES AND SERIES			
		FINANCE, GROWTH AND DECAY			
		ALGEBRA			
		DIFFERENTIAL CALCULUS			
		PROBABILITY			
		EUCLIDEAN GEOMETRY & MEASUREMENT			
		TRIGONOMETRY			
		ANALYTICAL GEOMETRY			
		STATISTICS			
		OTHER AREA(S) NUMBER			

	Skills	Please indicate which Maths skills are aimed for in your programme		
		Conceptual Understanding		
		Procedures & Mathematical Manipulations		
		Problem Solving Strategies		
	Perspectives	Please indicate which aspects of Maths are being promoted		
		Real Life Applications		
		Value of Maths in Society		
	Curriculum alignment	Indicate relevant characteristics of your Maths programme content.		
		CAPS aligned	✓	
		General content topics in Maths		
		Revision based content		
L. Assesment	***School Based***	Which aspects of assessment are integrated in your programme.		
		Setting of Tests	✓	
		Setting of Exams	✓	
		Homework strategies	✓	
	Extra-school	Assignments	✓	
		Group based assessment		
M. Teaching & Learning	***Pedagogical Skills***	Please select aspects of pedagogy that are included.		
		How, When, What to teach	✓	
		Classroom activities	✓	
		Assessment skills	✓	
	Technological Skills	Which pedagogy aspects are included in your Maths programme?		
		Scientific calculator skills		
		Computer & admin software skills.	✓	
		Mathematical software skills (e.g. GeoGebra)		
		Data projection / presentation skills		
		Internet skills		

	Learners' learning needs	Please indicate if the programme teaching promote the following:	
		Learner-centred methods	✓
		Knowledge of self-directed learning	✓
N. Support	***Teaching & Learning Materials***	Please indicate which training materials are distributed.	
		Textbooks, notes in hardcopy format	✓
		Digital resource material	✓
		Revision/practice material in hard copy format	
	Technical Support	Please indicate the nature of technical support provided.	
		Equipment like calculators, laptops, tablets	
		Internet access and navigation	✓
		Access to Learning Management Systems	
	Learning community	Please indicate if group work forms part of the training programme.	
		Group work during training	✓
O. Follow up	***Academic coherence and continuity***	Please indicate whether the programme sessions articulate with with each other or with other existing programmes which are similar.	
		Articulation exist between successive training sessions or with other similar programmes	
		Academic themes of training sessions are mutually supportive	
		Accumulation of skills and knowledge across the programme is progressive	
	QA strategies	Please indicate whether the following elements are in place:	
		Opportunities for reflection during training	✓
		Post programme feedback survey(s) is conducted	
		Progress of teachers are monitored and measured	
	Impact indicators	Feedback on impact is disseminated to stakeholders	

Thank you very much for completing this survey!

Annexure 4

Mathematics Skills Development Programme (MSDP) Survey

Name of Programme: **Developing the concept of function from patterns for senior phase teachers**

Programme Leader(s): **Anthea Roberts**

021 650 3851 (office)

anthea.roberts@uct.ac.za

Programme History: (number of previous offerings) twice previously

Programme Duration: 6 hours

Current Programme Accreditation: (if applicable) UCT accreditation

Credits: **Total: 2 credits**

NQF Level 6

Main Beneficiaries: Senior phase teachers

Short Programme Description:

If programme brochure, study guide or information document is available in electronic format, please send a copy to waolivier@nmmu.ac.za

Survey on Nature of Mathematics Teacher Development Programme:

Please check ✓ the box(es) that is directly applicable to your Maths development programme.

Please provide relevant comments with each item if applicable.

Profiling of Mathematics Existing Teacher Development Programme					**COMMENTS**
P. Content Knowledge Skills and Perspectives	***Learning Outcomes per Grade Level***	Please Select (✓) the Content Areas and indicate the Grade Level that applies to your programme		Grade Level (e.g. 11-12)	
		FUNCTIONS	✓	7-9	
		NUMBER PATTERNS, SEQUENCES AND SERIES	✓	7-9	
		FINANCE, GROWTH AND DECAY			
		ALGEBRA			
		DIFFERENTIAL CALCULUS			
		PROBABILITY			
		EUCLIDEAN GEOMETRY & MEASUREMENT			
		TRIGONOMETRY			
		ANALYTICAL GEOMETRY			
		STATISTICS			
		OTHER AREA(S)			

	Skills	Please indicate which Maths skills are aimed for in your programme	
		Conceptual Understanding	✓
		Procedures & Mathematical Manipulations	✓
		Problem Solving Strategies	✓
	Perspectives	Please indicate which aspects of Maths are being promoted	
		Real Life Applications	✓
		Value of Maths in Society	?
	Curriculum alignment	Indicate relevant characteristics of your Maths programme content.	
		CAPS aligned	✓
		General content topics in Maths	
		Revision based content	
Q. Assessment	***School Based***	Which aspects of assessment are integrated in your programme.	
		Setting of Tests	✓
		Setting of Exams	
		Homework strategies	
	Extra-school	Assignments	✓
		Group based assessment	
R. Teaching & Learning	***Pedagogical Skills***	Please select aspects of pedagogy that are included.	
		How, When, What to teach	✓
		Classroom activities	✓
		Assessment skills	✓
	Technological Skills	Which pedagogy aspects are included in your Maths programme?	
		Scientific calculator skills	✓
		Computer & admin software skills.	
		Mathematical software skills (e.g. GeoGebra)	✓
		Data projection / presentation skills	
		Internet skills	

	Learners' learning needs	Please indicate if the programme teaching promote the following:		
		Learner-centred methods	✓	
		Knowledge of self-directed learning	✓	
S. Support	***Teaching & Learning Materials***	Please indicate which training materials are distributed.		
		Textbooks, notes in hardcopy format	✓	
		Digital resource material	✓	
		Revision/practice material in hard copy format	✓	
	Technical Support	Please indicate the nature of technical support provided.		
		Equipment like calculators, laptops, tablets	✓	
		Internet access and navigation		
		Access to Learning Management Systems		
	Learning community	Please indicate if group work forms part of the training programme.		
		Group work during training		
T. Follow up	***Academic coherence and continuity***	Please indicate whether the programme sessions articulate with with each other or with other existing programmes which are similar.		
		Articulation exist between successive training sessions or with other similar programmes		
		Academic themes of training sessions are mutually supportive		
		Accumulation of skills and knowledge across the programme is progressive		
	QA strategies	Please indicate whether the following elements are in place:		
		Opportunities for reflection during training	✓	
		Post programme feedback survey(s) is conducted		
		Progress of teachers are monitored and measured		
	Impact indicators	Feedback on impact is disseminated to stakeholders		

Thank you very much for completing this survey!

Annexure 5

Mathematics Skills Development Programme (MSDP) Survey

Name of Programme: Designing geometry classroom activities

Programme Leader(s): Yusuf Johnson

021 650 3788 (office)

yusuf.johnson@uct.ac.za

Programme History: (number of previous offerings) 4-5 times previously

Programme Duration: 6 – 12 hours

Current Programme Accreditation: (if applicable) UCT accreditation

Credits: **Total: 1-2 credits**

NQF Level 6

Main Beneficiaries: Senior phase teachers

Short Programme Description:

If programme brochure, study guide or information document is available in electronic format, please send a copy to waolivier@nmmu.ac.za

Survey on Nature of Mathematics Teacher Development Programme:

Please check ✓ the box(es) that is directly applicable to your Maths development programme.

Please provide relevant comments with each item if applicable.

<table>
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<tr><td>NUMBER PATTERNS, SEQUENCES AND SERIES</td><td></td><td></td></tr>
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<tr><td>Skills</td><td>
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<tr><td>Conceptual Understanding</td><td>✓</td></tr>
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</td><td></td></tr>
</table>

		Procedures & Mathematical Manipulations	✓	
		Problem Solving Strategies	✓	
	Perspectives	Please indicate which aspects of Maths are being promoted		
		Real Life Applications	✓	
		Value of Maths in Society		
	Curriculum alignment	Indicate relevant characteristics of your Maths programme content.		
		CAPS aligned	✓	
		General content topics in Maths		
		Revision based content		
V. Assessment	***School Based***	Which aspects of assessment are integrated in your programme.		
		Setting of Tests	✓	
		Setting of Exams		
		Homework strategies		
	Extra-school	Assignments	✓	
		Group based assessment		
W. Teaching & Learning	***Pedagogical Skills***	Please select aspects of pedagogy that are included.		
		How, When, What to teach	✓	
		Classroom activities	✓	
		Assessment skills	✓	
	Technological Skills	Which pedagogy aspects are included in your Maths programme?		
		Scientific calculator skills	✓	
		Computer & admin software skills.		
		Mathematical software skills (e.g. GeoGebra)	✓	
		Data projection / presentation skills		
		Internet skills		
	Learners' learning needs	Please indicate if the programme teaching promote the following:		
		Learner-centred methods	✓	
		Knowledge of self-directed learning	✓	

X. Support	***Teaching & Learning Materials***	Please indicate which training materials are distributed.	
		Textbooks, notes in hardcopy format	✓
		Digital resource material	✓
		Revision/practice material in hard copy format	✓
	Technical Support	Please indicate the nature of technical support provided.	
		Equipment like calculators, laptops, tablets	✓
		Internet access and navigation	
		Access to Learning Management Systems	
	Learning community	Please indicate if group work forms part of the training programme.	
		Group work during training	
Y. Follow up	***Academic coherence and continuity***	Please indicate whether the programme sessions articulate with with each other or with other existing programmes which are similar.	
		Articulation exist between successive training sessions or with other similar programmes	
		Academic themes of training sessions are mutually supportive	
		Accumulation of skills and knowledge across the programme is progressive	
	QA strategies	Please indicate whether the following elements are in place:	
		Opportunities for reflection during training	✓
		Post programme feedback survey(s) is conducted	
		Progress of teachers are monitored and measured	
	Impact indicators	Feedback on impact is disseminated to stakeholders	

Thank you very much for completing this survey!

Annexure 6

Mathematics Skills Development Programme (MSDP) Survey

Name of Programme: Lines angles and constructions for senior phase

Programme Leader(s): Yusuf Johnson

021 650 3788 (office)

yusuf.johnson@uct.ac.za

Programme History: (number of previous offerings) twice previously

Programme Duration: 6 hours

Current Programme Accreditation: (if applicable) UCT accreditation

Credits: **Total: 2 credits**

NQF Level 6

Main Beneficiaries: Senior phase teachers

Short Programme Description:

If programme brochure, study guide or information document is available in electronic format, please send a copy to waolivier@nmmu.ac.za

Survey on Nature of Mathematics Teacher Development Programme:

Please check ✓ the box(es) that is directly applicable to your Maths development programme.

Please provide relevant comments with each item if applicable.

Profiling of Mathematics Existing Teacher Development Programme					**COMMENTS**
Z. Content Knowledge Skills and Perspectives	***Learning Outcomes per Grade Level***	Please Select (✓) the Content Areas and indicate the Grade Level that applies to your programme		Grade Level (e.g. 11-12)	
		FUNCTIONS			
		NUMBER PATTERNS, SEQUENCES AND SERIES			
		FINANCE, GROWTH AND DECAY			
		ALGEBRA			
		DIFFERENTIAL CALCULUS			
		PROBABILITY			
		EUCLIDEAN GEOMETRY & MEASUREMENT	✓	7-9	
		TRIGONOMETRY			
		ANALYTICAL GEOMETRY			
		STATISTICS			
		OTHER AREA(S) NUMBER			
	Skills	Please indicate which Maths skills are aimed for in your programme			
		Conceptual Understanding		✓	

		Procedures & Mathematical Manipulations	✓		
		Problem Solving Strategies	✓		
	Perspectives	Please indicate which aspects of Maths are being promoted			
		Real Life Applications	✓		
		Value of Maths in Society			
	Curriculum alignment	Indicate relevant characteristics of your Maths programme content.			
		CAPS aligned	✓		
		General content topics in Maths			
		Revision based content			
AA. Assesment	***School Based***	Which aspects of assessment are integrated in your programme.			
		Setting of Tests	✓		
		Setting of Exams			
		Homework strategies			
	Extra-school	Assignments	✓		
		Group based assessment			
BB. Teaching & Learning	***Pedagogical Skills***	Please select aspects of pedagogy that are included.			
		How, When, What to teach	✓		
		Classroom activities	✓		
		Assessment skills	✓		
	Technological Skills	Which pedagogy aspects are included in your Maths programme?			
		Scientific calculator skills	✓		
		Computer & admin software skills.			
		Mathematical software skills (e.g. GeoGebra)	✓		
		Data projection / presentation skills			
		Internet skills			
	Learners' learning needs	Please indicate if the programme teaching promote the following:			
		Learner-centred methods	✓		
		Knowledge of self-directed learning	✓		

CC. Support	***Teaching & Learning Materials***	Please indicate which training materials are distributed.			
		Textbooks, notes in hardcopy format	✓		
		Digital resource material	✓		
		Revision/practice material in hard copy format	✓		
	Technical Support	Please indicate the nature of technical support provided.			
		Equipment like calculators, laptops, tablets	✓		
		Internet access and navigation			
		Access to Learning Management Systems			
	Learning community	Please indicate if group work forms part of the training programme.			
		Group work during training			
DD. Follow up	***Academic coherence and continuity***	Please indicate whether the programme sessions articulate with with each other or with other existing programmes which are similar.			
		Articulation exist between successive training sessions or with other similar programmes			
		Academic themes of training sessions are mutually supportive			
		Accumulation of skills and knowledge across the programme is progressive			
	QA strategies	Please indicate whether the following elements are in place:			
		Opportunities for reflection during training	✓		
		Post programme feedback survey(s) is conducted			
		Progress of teachers are monitored and measured			
	Impact indicators	Feedback on impact is disseminated to stakeholders			

Thank you very much for completing this survey!

Annexure 7

Mathematics Skills Development Programme (MSDP) Survey

Name of Programme: Engaging with number for senior phase teachers

Programme Leader(s): Anthea Roberts

021 650 3851 (office)

anthea.roberts@uct.ac.za

Programme History: (number of previous offerings) twice previously

Programme Duration: 6 hours

Current Programme Accreditation: (if applicable) UCT accreditation

Credits: **Total: 2 credits**

NQF Level 6

Main Beneficiaries: Senior phase teachers

Short Programme Description:

If programme brochure, study guide or information document is available in electronic format, please send a copy to waolivier@nmmu.ac.za

Survey on Nature of Mathematics Teacher Development Programme:

Please check ✓ the box(es) that is directly applicable to your Maths development programme.

Please provide relevant comments with each item if applicable.

Profiling of Mathematics Existing Teacher Development Programme					**COMMENTS**
EE. Content Knowledge Skills and Perspectives	***Learning Outcomes per Grade Level***	Please Select (✓) the Content Areas and indicate the Grade Level that applies to your programme		Grade Level (e.g. 11-12)	
		FUNCTIONS			
		NUMBER PATTERNS, SEQUENCES AND SERIES	✓	7-9	
		FINANCE, GROWTH AND DECAY			
		ALGEBRA			
		DIFFERENTIAL CALCULUS			
		PROBABILITY			
		EUCLIDEAN GEOMETRY & MEASUREMENT			
		TRIGONOMETRY			
		ANALYTICAL GEOMETRY			
		STATISTICS			
		OTHER AREA(S) NUMBER	✓	7-9	
	Skills	Please indicate which Maths skills are aimed for in your programme			
		Conceptual Understanding		✓	

		Procedures & Mathematical Manipulations	✓	
		Problem Solving Strategies	✓	
	Perspectives	Please indicate which aspects of Maths are being promoted		
		Real Life Applications		
		Value of Maths in Society		
	Curriculum alignment	Indicate relevant characteristics of your Maths programme content.		
		CAPS aligned	✓	
		General content topics in Maths		
		Revision based content		
FF. Assessment	***School Based***	Which aspects of assessment are integrated in your programme.		
		Setting of Tests	✓	
		Setting of Exams		
		Homework strategies		
	Extra-school	Assignments	✓	
		Group based assessment		
GG. Teaching & Learning	***Pedagogical Skills***	Please select aspects of pedagogy that are included.		
		How, When, What to teach	✓	
		Classroom activities	✓	
		Assessment skills	✓	
	Technological Skills	Which pedagogy aspects are included in your Maths programme?		
		Scientific calculator skills	✓	
		Computer & admin software skills.		
		Mathematical software skills (e.g. GeoGebra)		
		Data projection / presentation skills		
		Internet skills		
	Learners' learning needs	Please indicate if the programme teaching promote the following:		
		Learner-centred methods	✓	
		Knowledge of self-directed learning	✓	

HH. Support	***Teaching & Learning Materials***	Please indicate which training materials are distributed.	
		Textbooks, notes in hardcopy format	✓
		Digital resource material	✓
		Revision/practice material in hard copy format	✓
	Technical Support	Please indicate the nature of technical support provided.	
		Equipment like calculators, laptops, tablets	
		Internet access and navigation	
		Access to Learning Management Systems	
	Learning community	Please indicate if group work forms part of the training programme.	
		Group work during training	
II. Follow up	***Academic coherence and continuity***	Please indicate whether the programme sessions articulate with with each other or with other existing programmes which are similar.	
		Articulation exist between successive training sessions or with other similar programmes	
		Academic themes of training sessions are mutually supportive	
		Accumulation of skills and knowledge across the programme is progressive	
	QA strategies	Please indicate whether the following elements are in place:	
		Opportunities for reflection during training	✓
		Post programme feedback survey(s) is conducted	
		Progress of teachers are monitored and measured	
	Impact indicators	Feedback on impact is disseminated to stakeholders	

Thank you very much for completing this survey!

Annexure 8

Mathematics Skills Development Programme (MSDP) Survey

Name of Programme: **Probability for CAPS content for senior phase**

Programme Leader(s): **Roger MacKay**

021 650 5622 (office)

roger.mackay@uct.ac.za

Programme History: (number of previous offerings) 4 times previously

Programme Duration: 6 hours

Current Programme Accreditation: (if applicable) UCT accreditation

Credits: **Total: 1-2 credits**

NQF Level 6

Main Beneficiaries: Senior phase teachers

Short Programme Description:

If programme brochure, study guide or information document is available in electronic format, please send a copy to waolivier@nmmu.ac.za

Survey on Nature of Mathematics Teacher Development Programme:

Please check ✓ the box(es) that is directly applicable to your Maths development programme.

Please provide relevant comments with each item if applicable.

Profiling of Mathematics Existing Teacher Development Programme				
JJ. Content Knowledge Skills and Perspectives	***Learning Outcomes per Grade Level***	Please Select (✓) the Content Areas and indicate the Grade Level that applies to your programme		Grade Level (e.g. 11-12)
		FUNCTIONS		
		NUMBER PATTERNS, SEQUENCES AND SERIES		
		FINANCE, GROWTH AND DECAY		
		ALGEBRA		
		DIFFERENTIAL CALCULUS		
		PROBABILITY	✓	7-9
		EUCLIDEAN GEOMETRY & MEASUREMENT		
		TRIGONOMETRY		
		ANALYTICAL GEOMETRY		
		STATISTICS		
		OTHER AREA(S) NUMBER		
	Skills	Please indicate which Maths skills are aimed for in your programme		
		Conceptual Understanding	✓	

		Procedures & Mathematical Manipulations	✓
		Problem Solving Strategies	✓
	Perspectives	Please indicate which aspects of Maths are being promoted	
		Real Life Applications	✓
		Value of Maths in Society	✓
	Curriculum alignment	Indicate relevant characteristics of your Maths programme content.	
		CAPS aligned	✓
		General content topics in Maths	
		Revision based content	
KK. Assesment	***School Based***	Which aspects of assessment are integrated in your programme.	
		Setting of Tests	✓
		Setting of Exams	
		Homework strategies	
	Extra-school	Assignments	✓
		Group based assessment	
LL. Teaching & Learning	***Pedagogical Skills***	Please select aspects of pedagogy that are included.	
		How, When, What to teach	✓
		Classroom activities	✓
		Assessment skills	✓
	Technological Skills	Which pedagogy aspects are included in your Maths programme?	
		Scientific calculator skills	
		Computer & admin software skills.	
		Mathematical software skills (e.g. GeoGebra)	
		Data projection / presentation skills	
		Internet skills	
	Learners' learning needs	Please indicate if the programme teaching promote the following:	
		Learner-centred methods	✓
		Knowledge of self-directed learning	✓

MM. Support	***Teaching & Learning Materials***	Please indicate which training materials are distributed.	
		Textbooks, notes in hardcopy format	✓
		Digital resource material	✓
		Revision/practice material in hard copy format	✓
	Technical Support	Please indicate the nature of technical support provided.	
		Equipment like calculators, laptops, tablets	
		Internet access and navigation	
		Access to Learning Management Systems	
	Learning community	Please indicate if group work forms part of the training programme.	
		Group work during training	
NN. Follow up	***Academic coherence and continuity***	Please indicate whether the programme sessions articulate with with each other or with other existing programmes which are similar.	
		Articulation exist between successive training sessions or with other similar programmes	
		Academic themes of training sessions are mutually supportive	
		Accumulation of skills and knowledge across the programme is progressive	
	QA strategies	Please indicate whether the following elements are in place:	
		Opportunities for reflection during training	✓
		Post programme feedback survey(s) is conducted	
		Progress of teachers are monitored and measured	
	Impact indicators	Feedback on impact is disseminated to stakeholders	

Thank you very much for completing this survey!

Annexure 9

Mathematics Skills Development Programme (MSDP) Survey

Name of Programme: Area Health Education Centre

Programme Leader(s): Ramesh Jeram

Programme History: been running since 2013, third offering in 2015

Programme Duration: 6 months

Current Programme Accreditation: accredited by Stellenbosch University

Main Beneficiaries: in-service FET and SP mathematics teachers

Short Programme Description:

Short course in specific content areas for 35 FET and 35 SP mathematics teachers from within the Overberg, Westcoast and Winelands districts in the Western Cape (funder stipulation regarding districts). The mode of delivery is that of practice-based professional learning where participants are supported through mentoring to implement knowledge that was acquired during contact sessions in their classrooms. Stellenbosch University Centre for Pedagogy (SUNCEP) has recently launched a major e-learning initiative that will further strengthen professional learning initiatives. This initiative is aligned to the applicable policies of government and the university, namely the White Paper on e-Education (2004), which states that "the use of ICT's as flexible tools for teaching and learning must be integrated into pre-service and in-service training" and the SU Institutional Intent and Strategy 2013-2018 stating that it "expands short courses with virtual learning, invests in blended and virtual learning models" hence the use of tablets by teachers in the contact session (fully loaded with the required module) and the telematics platform.

If programme brochure, study guide or information document is available in electronic format, please send a copy to waolivier@nmmu.ac.za

Survey on Nature of Mathematics Teacher Development Programme:

Please check ✓ the box(es) that is directly applicable to your Maths development programme.

Please provide relevant comments with each item if applicable.

Profiling of Mathematics Existing Teacher Development Programme					COMMENTS
Content Knowledge Skills and Perspectives	***Learning Outcomes per Grade Level***	Please Select (✓) the Content Areas and indicate the Grade Level that applies to your programme		Grade Level (e.g. 11-12)	
		FUNCTIONS			
		NUMBER PATTERNS, SEQUENCES AND SERIES ✓ **(patterns functions and algebra)**		Grade 7-9	
		FINANCE, GROWTH AND DECAY			
		ALGEBRA			
		DIFFERENTIAL CALCULUS			
		PROBABILITY			
		EUCLIDEAN GEOMETRY & MEASUREMENT			
		TRIGONOMETRY ✓		Grade 11-12	
		ANALYTICAL GEOMETRY			
		STATISTICS			
		OTHER AREA(S)			
	Skills	Please indicate which Maths skills are aimed for in your programme			
		Conceptual Understanding		✓	
		Procedures & Mathematical Manipulations		✓	
		Problem Solving Strategies		✓	
	Perspectives	Please indicate which aspects of Maths are being promoted			
		Real Life Applications		✓	
		Value of Maths in Society		✓	

	Curriculum alignment	Indicate relevant characteristics of your Maths programme content.		
		CAPS aligned	✓	
		General content topics in Maths	✓	
		Revision based content	✓	
Assesment	***School Based***	Which aspects of assessment are integrated in your programme.		
		Setting of Tests	✓	
		Setting of Exams	✓	
		Homework strategies	✓	
	Extra-school	Assignments	✓	
		Group based assessment		
Teaching & Learning	***Pedagogical Skills***	Please select aspects of pedagogy that are included.		
		How, When, What to teach	✓	
		Classroom activities	✓	
		Assessment skills	✓	
	Technological Skills	Which pedagogy aspects are included in your Maths programme?		
		Scientific calculator skills	✓	
		Computer & admin software skills.	✓	
		Mathematical software skills (e.g. GeoGebra)	✓	
		Data projection / presentation skills	✓	
		Internet skills	✓	
	Learners' learning needs	Please indicate if the programme teaching promote the following:		
		Learner-centred methods	✓	
		Knowledge of self-directed learning	✓	

Support	***Teaching & Learning Materials***	Please indicate which training materials are distributed.		
		Textbooks, notes in hardcopy format	✓	
		Digital resource material	✓	
		Revision/practice material in hard copy format	✓	
	Technical Support	Please indicate the nature of technical support provided.		
		Equipment like calculators, laptops, tablets	✓	
		Internet access and navigation	✓	
		Access to Learning Management Systems		
	Learning community	Please indicate if group work forms part of the training programme.		
		Group work during training	✓	
Follow up	***Academic coherence and continuity***	Please indicate whether the programme sessions articulate with with each other or with other existing programmes which are similar.		
		Articulation exist between successive training sessions or with other similar programmes	✓	
		Academic themes of training sessions are mutually supportive	✓	
		Accumulation of skills and knowledge across the programme is progressive	✓	
	QA strategies	Please indicate whether the following elements are in place:		Our Mentor programme is cluster and individually based
		Opportunities for reflection during training	✓	
		Post programme feedback survey(s) is conducted	✓	
		Progress of teachers are monitored and measured	✓	
	Impact indicators	Feedback on impact is disseminated to stakeholders	✓	

Thank you very much for completing this survey!

Annexure 10

Mathematics Skills Development Programme (MSDP) Survey

Name of Programme: NAMASCI

Programme Leader(s): Ramesh Jeram

Programme History: FIRST OFFERING

Programme Duration: 6 months

Current Programme Accreditation: accredited by Stellenbosch University

Main Beneficiaries: in-service FET mathematics teachers

Short Programme Description:

Short course in specific content areas for 30 FET mathematics teachers from within the NAMAKWA district in the NORTHERN CAPE (funder stipulation regarding district). The mode of delivery is that of practice-based professional learning where participants are supported through mentoring to implement knowledge that was acquired during contact sessions in their classrooms. Stellenbosch University Centre for Pedagogy (SUNCEP) has recently launched a major e-learning initiative that will further strengthen professional learning initiatives. This initiative is aligned to the applicable policies of government and the university, namely the White Paper on e-Education (2004), which states that "the use of ICT's as flexible tools for teaching and learning must be integrated into pre-service and in-service training" and the SU Institutional Intent and Strategy 2013-2018 stating that it "expands short courses with virtual learning, invests in blended and virtual learning models" hence the use of tablets by teachers in the contact session (fully loaded with the required module) and the telematics platform.

If programme brochure, study guide or information document is available in electronic format, please send a copy to waolivier@nmmu.ac.za

Survey on Nature of Mathematics Teacher Development Programme:

Please check ✓ the box(es) that is directly applicable to your Maths development programme.

Please provide relevant comments with each item if applicable.

Profiling of Mathematics Existing Teacher Development Programme					COMMENTS
OO. Content Knowledge Skills and Perspectives	***Learning Outcomes per Grade Level***	Please Select (✓) the Content Areas and indicate the Grade Level that applies to your programme		Grade Level (e.g. 11-12)	
		FUNCTIONS			
		NUMBER PATTERNS, SEQUENCES AND SERIES			
		FINANCE, GROWTH AND DECAY			
		ALGEBRA			
		DIFFERENTIAL CALCULUS			
		PROBABILITY			
		EUCLIDEAN GEOMETRY & MEASUREMENT			
		TRIGONOMETRY ✓		Grade 10-12	
		ANALYTICAL GEOMETRY			
		STATISTICS			
		OTHER AREA(S)			
	Skills	Please indicate which Maths skills are aimed for in your programme			
		Conceptual Understanding		✓	
		Procedures & Mathematical Manipulations		✓	
		Problem Solving Strategies		✓	
	Perspectives	Please indicate which aspects of Maths are being promoted			
		Real Life Applications		✓	
		Value of Maths in Society		✓	
	Curriculum alignment	Indicate relevant characteristics of your Maths programme content.			

		CAPS aligned	✓
		General content topics in Maths	✓
		Revision based content	✓
Assesment	***School Based***	Which aspects of assessment are integrated in your programme.	
		Setting of Tests	✓
		Setting of Exams	✓
		Homework strategies	✓
	Extra-school	Assignments	✓
		Group based assessment	
Teaching & Learning	***Pedagogical Skills***	Please select aspects of pedagogy that are included.	
		How, When, What to teach	✓
		Classroom activities	✓
		Assessment skills	✓
	Technological Skills	Which pedagogy aspects are included in your Maths programme?	
		Scientific calculator skills	✓
		Computer & admin software skills.	✓
		Mathematical software skills (e.g. GeoGebra)	✓
		Data projection / presentation skills	✓
		Internet skills	✓
	Learners' learning needs	Please indicate if the programme teaching promote the following:	
		Learner-centred methods	✓
		Knowledge of self-directed learning	✓
	Teaching &	Please indicate which training materials are distributed.	

Support	***Learning Materials***	Textbooks, notes in hardcopy format	✓	
		Digital resource material	✓	
		Revision/practice material in hard copy format	✓	
	Technical Support	Please indicate the nature of technical support provided.		
		Equipment like calculators, laptops, tablets	✓	
		Internet access and navigation	✓	
		Access to Learning Management Systems		
	Learning community	Please indicate if group work forms part of the training programme.		
		Group work during training	✓	
Follow up	***Academic coherence and continuity***	Please indicate whether the programme sessions articulate with with each other or with other existing programmes which are similar.		
		Articulation exist between successive training sessions or with other similar programmes	✓	
		Academic themes of training sessions are mutually supportive	✓	
		Accumulation of skills and knowledge across the programme is progressive	✓	
	QA strategies	Please indicate whether the following elements are in place:		Our Mentor programme is cluster and individually based
		Opportunities for reflection during training	✓	
		Post programme feedback survey(s) is conducted	✓	
		Progress of teachers are monitored and measured	✓	
	Impact indicators	Feedback on impact is disseminated to stakeholders	✓	

Thank you very much for completing this survey!

Annexure 11

Mathematics Skills Development Programme (MSDP) Survey

Name of Programme: Eden Karoo

Programme Leader(s): Ramesh Jeram

Programme History: FIRST OFFERING

Programme Duration: 6 months

Current Programme Accreditation: accredited by Stellenbosch University

Main Beneficiaries: in-service SP mathematics teachers

Short Programme Description:

Short course in specific content areas for 113 SP mathematics teachers from within the Eden Karoo district in the Western Cape (funder stipulation regarding district). The mode of delivery is that of practice-based professional learning where participants are supported through mentoring to implement knowledge that was acquired during contact sessions in their classrooms. Stellenbosch University Centre for Pedagogy (SUNCEP) has recently launched a major e-learning initiative that will further strengthen professional learning initiatives. This initiative is aligned to the applicable policies of government and the university, namely the White Paper on e-Education (2004), which states that "the use of ICT's as flexible tools for teaching and learning must be integrated into pre-service and in-service training" and the SU Institutional Intent and Strategy 2013-2018 stating that it "expands short courses with virtual learning, invests in blended and virtual learning models" hence the use of tablets by teachers in the contact session (fully loaded with the required module) and the telematics platform.

If programme brochure, study guide or information document is available in electronic format, please send a copy to waolivier@nmmu.ac.za

Survey on Nature of Mathematics Teacher Development Programme:

Please check ✓ the box(es) that is directly applicable to your Maths development programme.

Please provide relevant comments with each item if applicable.

Profiling of Mathematics Existing Teacher Development Programme					COMMENTS
Content Knowledge Skills and Perspectives	***Learning Outcomes per Grade Level***	Please Select (✓) the Content Areas and indicate the Grade Level that applies to your programme		Grade Level (e.g. 11-12)	
		FUNCTIONS			
		NUMBER PATTERNS, SEQUENCES AND SERIES ✓ **(patterns functions and algebra)**		Grade 7-9	
		FINANCE, GROWTH AND DECAY			
		ALGEBRA			
		DIFFERENTIAL CALCULUS			
		PROBABILITY			
		EUCLIDEAN GEOMETRY & MEASUREMENT ✓ **(space and shape)**		Grade 7-9	
		TRIGONOMETRY			
		ANALYTICAL GEOMETRY			
		STATISTICS			
		OTHER AREA(S)			
	Skills	Please indicate which Maths skills are aimed for in your programme			
		Conceptual Understanding	✓		
		Procedures & Mathematical Manipulations	✓		
		Problem Solving Strategies	✓		
	Perspectives	Please indicate which aspects of Maths are being promoted			
		Real Life Applications	✓		
		Value of Maths in Society	✓		

	Curriculum alignment	Indicate relevant characteristics of your Maths programme content.		
		CAPS aligned	✓	
		General content topics in Maths	✓	
		Revision based content	✓	
Assesment	***School Based***	Which aspects of assessment are integrated in your programme.		
		Setting of Tests	✓	
		Setting of Exams	✓	
		Homework strategies	✓	
	Extra-school	Assignments	✓	
		Group based assessment		
Teaching & Learning	***Pedagogical Skills***	Please select aspects of pedagogy that are included.		
		How, When, What to teach	✓	
		Classroom activities	✓	
		Assessment skills	✓	
	Technological Skills	Which pedagogy aspects are included in your Maths programme?		
		Scientific calculator skills	✓	
		Computer & admin software skills.	✓	
		Mathematical software skills (e.g. GeoGebra)	✓	
		Data projection / presentation skills	✓	
		Internet skills	✓	
	Learners' learning needs	Please indicate if the programme teaching promote the following:		
		Learner-centred methods	✓	
		Knowledge of self-directed learning	✓	

Support	***Teaching & Learning Materials***	Please indicate which training materials are distributed.		
		Textbooks, notes in hardcopy format	✓	
		Digital resource material	✓	
		Revision/practice material in hard copy format	✓	
	Technical Support	Please indicate the nature of technical support provided.		
		Equipment like calculators, laptops, tablets	✓	
		Internet access and navigation	✓	
		Access to Learning Management Systems		
	Learning community	Please indicate if group work forms part of the training programme.		
		Group work during training	✓	
Follow up	***Academic coherence and continuity***	Please indicate whether the programme sessions articulate with with each other or with other existing programmes which are similar.		
		Articulation exist between successive training sessions or with other similar programmes	✓	
		Academic themes of training sessions are mutually supportive	✓	
		Accumulation of skills and knowledge across the programme is progressive	✓	
	QA strategies	Please indicate whether the following elements are in place:		Our Mentor programme is cluster and individually based
		Opportunities for reflection during training	✓	
		Post programme feedback survey(s) is conducted	✓	
		Progress of teachers are monitored and measured	✓	
	Impact indicators	Feedback on impact is disseminated to stakeholders	✓	

Thank you very much for completing this survey!

Annexure 12

Mathematics Skills Development Programme (MSDP) Survey

Name of Programme: Wits Maths Connect Secondary Project

Programme Leader(s): Prof Jill Adler, FRF-NRF Chair in Mathematics Education, Project Director

Dr Craig Pournara, Project Manager

Programme History: (number of previous offerings)

Research and Development project

Phase 1: 2010 – 2014

Phase 2: 2015 – 2019

Main focus of our development work: 2 professional development courses

Also run lesson study sessions with clusters of project schools: 3 x 3-week blocks per year

Programme Duration: 1 year

Current Programme Accreditation: (if applicable) None

Main Beneficiaries: Secondary school mathematics teachers in selected schools in

Johannesburg area

Short Programme Description:

Developed Transition Maths 1 and Transition Maths 2 as 2 professional development courses offered to teachers in our project schools. Our goal in these courses is to explore workable models of professional development that primarily focus on teachers' subject matter knowledge while giving some attention to teaching issues. See attached course handouts for more detail.

If programme brochure, study guide or information document is available in electronic format, please send a copy to waolivier@nmmu.ac.za

Survey on Nature of Mathematics Teacher Development Programme:

Please check ✓ the box(es) that is directly applicable to your Maths development programme.

Please provide relevant comments with each item if applicable.

Profiling of Mathematics Existing Teacher Development Programme	COMMENTS

Content Knowledge Skills and Perspectives	***Learning Outcomes per Grade Level***	Please Select (✓) the Content Areas and indicate the Grade Level that applies to your programme	Grade Level (e.g. 11-12)
		FUNCTIONS X	9-12
		NUMBER PATTERNS, SEQUENCES AND SERIES x	9-10
		FINANCE, GROWTH AND DECAY	
		ALGEBRA X	8-11
		DIFFERENTIAL CALCULUS X	12
		PROBABILITY	
		EUCLIDEAN GEOMETRY & MEASUREMENT X	8-12
		TRIGONOMETRY X	10-12
		ANALYTICAL GEOMETRY	
		STATISTICS	
		OTHER AREA(S)	
	Skills	Please indicate which Maths skills are aimed for in your programme	These
		Conceptual Understanding X	dichotomies are not helpful in describing our programme. Substantial focus on key aspects of doing mathematics, e.g. defining, proving, working deductively and inductively, connecting representations
		Procedures & Mathematical Manipulations X	
		Problem Solving Strategies	

TM1 course focuses mainly on algebra and functions, with some attention to trigonometry and Euclidean geometry

TM2 course deals with algebra, function, calculus, trigonometry and Euclidean geometry

	Perspectives	Please indicate which aspects of Maths are being promoted	Some attention applications in trigonometry and calculus
		Real Life Applications	x
		Value of Maths in Society	
	Curriculum alignment	Indicate relevant characteristics of your Maths programme content	Focus on the key concepts in the selected areas of each course. We address the scope of the current curriculum but do not limit the scope of content covered in the courses to the school curriculum
		CAPS aligned	
		General content topics in Maths	x
		Revision based content	
Assesment	***School Based***	Which aspects of assessment are integrated in your programme:	Assessment is not a major focus in our current work, in 2012 we worked with teachers to set common exams in Gr 9 and 10
		Setting of Tests	
		Setting of Exams	x
		Homework strategies	
	Extra-school	Assignments	x Mainly individual work on mathematics tasks and teaching tasks
		Group based assessment	
Teaching &	***Pedagogical Skills***	Please select aspects of pedagogy that are included.	Our main focus is on:

Learning		How, When, What to teach	x selection and sequencing of examples; tasks and representations; explanatory talk; learner engagement
		Classroom activities	x
		Assessment skills	
	Technological Skills	Which pedagogy aspects are included in your Maths programme?	All 3 indicated are given some attention but Geogebra gets the most attention
		Scientific calculator skills	x
		Computer & admin software skills.	
		Mathematical software skills (e.g. GeoGebra)	x
		Data projection / presentation skills	
		Internet skills	x
	Learners' learning needs	Please indicate if the programme teaching promote the following:	These descriptions are jargon. We believe that the teacher is central to the mediation of mathematical concepts but we also pay attention to the opportunities made available for active learner participation. These are
		Learner-centred methods	
		Knowledge of self-directed learning	

<table>
<tr><td></td><td></td><td></td><td>driven by the tasks that the teacher choses and how the teacher mediates</td></tr>
<tr><td rowspan="3">Support</td><td>Teaching & Learning Materials</td><td><table><tr><td>Please indicate which training materials are distributed.</td><td></td></tr><tr><td>Textbooks, notes in hardcopy format</td><td>x</td></tr><tr><td>Digital resource material</td><td></td></tr><tr><td>Revision/practice material in hard copy format</td><td></td></tr></table></td><td></td></tr>
<tr><td>Technical Support</td><td><table><tr><td>Please indicate the nature of technical support provided.</td><td></td></tr><tr><td>Equipment like calculators, laptops, tablets</td><td>x</td></tr><tr><td>Internet access and navigation</td><td></td></tr><tr><td>Access to Learning Management Systems</td><td></td></tr></table></td><td>Participating schools receive at least 1 laptop and 1 data projector. Teachers on courses are expected to make use of computers in the course. Materials from course are placed on restricted access e-learning site</td></tr>
<tr><td>Learning community</td><td><table><tr><td>Please indicate if group work forms part of the training programme</td><td></td></tr><tr><td>Group work during training</td><td>x</td></tr></table></td><td>Teachers work in groups frequently.</td></tr>
<tr><td>Follow up</td><td>Academic coherence and continuity</td><td><table><tr><td>Please indicate whether the programme sessions articulate with each other or with other existing programmes which are similar.</td><td></td></tr><tr><td>Articulation exist between successive training sessions or with other similar programmes</td><td>x</td></tr><tr><td>Academic themes of training sessions are mutually supportive</td><td>x</td></tr></table></td><td>Both courses form a coherent and extended learning opportunity for teachers. There is a progression</td></tr>
</table>

		Accumulation of skills and knowledge across the programme is progressive	x from TM1 to TM2 although some teachers will only do TM2 and some will only cope with TM1
	QA strategies	Please indicate whether the following elements are in place	Forms part of development work hence questionnaires and surveys at key points in the programmes. Research components of project investigate teacher take-up from programme and impact on learning gains
		Opportunities for reflection during training	x
		Post programme feedback survey(s) is conducted	x
		Progress of teachers are monitored and measured	x
	Impact indicators	Feedback on impact is disseminated to stakeholders	x Article under review reporting on impact of PD on learning gains

Thank you very much for completing this survey!

Annexure 13

Mathematics Skills Development Programme (SDP) Survey

Name of Programme: AIMSSEC is the Schools Enrichment Centre of AIMS (African Institute for Mathe

Programme Leader(s): Dr S.v.R. Barnard (Aka: Barrie)

1.1 **Programme History:** (number of previous offerings) 1 330 teachers attended our Mathematical Thinking (MT) three-month course and 204 students have completed the two year ACE courses.

Programme Duration: MT short course – 3 months

ACE – 2 years. Will be replaced by the new ACT

Current Programme Accreditation: (if applicable)

SACE endorsement for MT course.

University accreditation for the two year ACE: University of Fort Hare for the ACE that is coming to an end this year.

Then North-West University (NWU) will accredit the new ACT.

Main Beneficiaries: Under- or un qualified mathematics teachers

Short Programme Description:

AIMSSEC runs blended learning professional development courses for primary and secondary mathematics teachers, subject advisers and field trainers from disadvantaged rural and township schools to empower them to help other teachers in their areas. AIMSSEC continues to support them through an online teachers' network after they have finished their courses.

AIMSSEC has 1 330 students who have completed the Mathematical Thinking (MT) three-month course and 204 students who have completed the two year ACE courses and they are now looking for opportunities to study further.
AIMSSEC has twelve years' experience administering, teaching and coordinating blended/distance learning courses involving:

- Moodle and e-learning;
- monthly assignments and formal end of year examinations;
- interactive telematic sessions (TV broadcasts);
- residential face-to face contact sessions with teachers from all parts of South Africa – we have held twenty-seven such residential courses in the Western and Eastern Cape;
- a distinguished team of more than fifty-five international mathematics education experts have assisted on these courses.

To support the cascade model of teacher professional development, the AIMSSEC local and international team is writing a series of books consisting of teacher self-help-workshop guides. Cambridge University Press (CUP) has signed a contract to publish the series of books. The first book will be available by the end of April 2016.

If programme brochure, study guide or information document is available in electronic format, please send a copy to waolivier@nmmu.ac.za

Survey on Nature of Mathematics Teacher Development Programme:

Please check ✓ the box(es) that is directly applicable to your Maths development programme.

Please provide relevant comments with each item if applicable.

<table>
<tr><th colspan="3">Profiling of Mathematics Existing Teacher Development Programme</th><th>COMMENTS</th></tr>
<tr><td>A. Content Knowledge Skills and Perspectives</td><td>Learning Outcomes per Grade Level</td><td>
<table>
<tr><td>Please Select (✓) the Content Areas and indicate the Grade Level that applies to your programme</td><td></td><td>Grade Level (e.g. 11-12)</td></tr>
<tr><td>FUNCTIONS</td><td>✓</td><td></td></tr>
<tr><td>NUMBER PATTERNS, SEQUENCES AND SERIES</td><td>✓</td><td></td></tr>
<tr><td>FINANCE, GROWTH AND DECAY</td><td>✓</td><td></td></tr>
<tr><td>ALGEBRA</td><td>✓</td><td></td></tr>
<tr><td>DIFFERENTIAL CALCULUS</td><td>✓</td><td></td></tr>
<tr><td>PROBABILITY</td><td>✓</td><td></td></tr>
<tr><td>EUCLIDEAN GEOMETRY & MEASUREMENT</td><td>✓</td><td></td></tr>
<tr><td>TRIGONOMETRY</td><td>✓</td><td></td></tr>
<tr><td>ANALYTICAL GEOMETRY</td><td>✓</td><td></td></tr>
<tr><td>STATISTICS</td><td>✓</td><td></td></tr>
<tr><td>OTHER AREA(S)</td><td></td><td></td></tr>
</table>
</td><td>The ACE or ACR course covers all the topics over a two year period.

The MT course focuses on training teachers in grades 4 and 5 for the Intermediate phase group; grades 7 and 8 for the Senior phase group and grades 10 and 11 for the FET phase group. The coverage includes number, algebra, shapes, measures, data handling and probability.

.</td></tr>
<tr><td></td><td>Skills</td><td>
<table>
<tr><td colspan="2">Please indicate which Maths skills are aimed for in your programme</td></tr>
<tr><td>Conceptual Understanding</td><td>✓</td></tr>
<tr><td>Procedures & Mathematical Manipulations</td><td>✓</td></tr>
<tr><td>Problem Solving Strategies</td><td>✓</td></tr>
</table>
</td><td></td></tr>
<tr><td></td><td>Perspectives</td><td>
<table>
<tr><td colspan="2">Please indicate which aspects of Maths are being promoted</td></tr>
<tr><td>Real Life Applications</td><td>✓</td></tr>
</table>
</td><td></td></tr>
</table>

<table>
<tr><td></td><td></td><td><table><tr><td>Value of Maths in Society</td><td>✓</td></tr></table></td><td></td></tr>
<tr><td></td><td>Curriculum alignment</td><td><table><tr><td colspan="2">Indicate relevant characteristics of your Maths programme content.</td></tr><tr><td>CAPS aligned</td><td>✓</td></tr><tr><td>General content topics in Maths</td><td>✓</td></tr><tr><td>Revision based content</td><td></td></tr></table></td><td></td></tr>
<tr><td>B. Assesment</td><td>School Based</td><td><table><tr><td colspan="2">Which aspects of assessment are integrated in your programme.</td></tr><tr><td>Setting of Tests</td><td>✓</td></tr><tr><td>Setting of Exams</td><td></td></tr><tr><td>Homework strategies</td><td>✓</td></tr></table></td><td></td></tr>
<tr><td></td><td>Extra-school</td><td><table><tr><td>Assignments</td><td>✓</td></tr><tr><td>Group based assessment</td><td>✓</td></tr></table></td><td></td></tr>
<tr><td>C. Teaching & Learning</td><td>Pedagogical Skills</td><td><table><tr><td colspan="2">Please select aspects of pedagogy that are included.</td></tr><tr><td>How, When, What to teach</td><td>✓</td></tr><tr><td>Classroom activities</td><td>✓</td></tr><tr><td>Assessment skills</td><td>✓</td></tr></table></td><td>The purpose of the MT course is to secure and extend subject knowledge of mathematics and to develop pedagogical insights which lead to enquiry-based learning. There is an emphasis on planning for learning (rather than planning for teaching), differentiation, inclusive learning, progression, reflection on one’s practice using journals and the use of formative assessment tools</td></tr>
</table>

<table>
<tr><td></td><td></td><td></td><td>to identify strengths and weaknesses of learners.</td></tr>
<tr><td></td><td>Technological Skills</td><td>
<table>
<tr><td colspan="2">Which technological aspects are included in your Maths programme?</td></tr>
<tr><td>Scientific calculator skills</td><td>✓</td></tr>
<tr><td>Computer & admin software skills.</td><td>✓</td></tr>
<tr><td>Mathematical software skills (e.g. GeoGebra)</td><td>✓</td></tr>
<tr><td>Data projection / presentation skills</td><td></td></tr>
<tr><td>Internet skills</td><td>✓</td></tr>
</table>
</td><td>The MT and ACE courses also includes IT sessions to introduce teachers to using technology in teaching mathematics and in their professional work.</td></tr>
<tr><td></td><td>Learners' learning needs</td><td>
<table>
<tr><td colspan="2">Please indicate if the programme teaching promote the following:</td></tr>
<tr><td>Learner-centred methods</td><td>✓</td></tr>
<tr><td>Knowledge of self-directed learning</td><td>✓</td></tr>
</table>
</td><td></td></tr>
<tr><td>D. Support</td><td>Teaching & Learning Materials</td><td>
<table>
<tr><td colspan="2">Please indicate which training materials are distributed.</td></tr>
<tr><td>Textbooks, notes in hardcopy format</td><td>✓</td></tr>
<tr><td>Digital resource material</td><td>✓</td></tr>
<tr><td>Revision/practice material in hard copy format</td><td>✓</td></tr>
</table>
</td><td></td></tr>
<tr><td></td><td>Technical Support</td><td>
<table>
<tr><td colspan="2">Please indicate the nature of technical support provided.</td></tr>
<tr><td>Equipment like calculators, laptops, tablets</td><td>✓</td></tr>
<tr><td>Internet access and navigation</td><td>✓</td></tr>
</table>
</td><td></td></tr>
</table>

		Access to Learning Management Systems	
	Learning community	Please indicate if group work forms part of the training programme.	
		Group work during training ✓	
E. Follow up	***Academic coherence and continuity***	Please indicate whether the programme sessions articulate with with each other or with other existing programmes which are similar.	
		Articulation exist between successive training sessions or with other similar programmes ✓	
		Academic themes of training sessions are mutually supportive ✓	
		Accumulation of skills and knowledge across the programme is progressive ✓	
	QA strategies	Please indicate whether the following elements are in place:	Journals are kept by attendants and marked by tutors. Each participant is expected to complete 2 assignments following the residential course. The assignments are designed to encourage the participants to reflect on their teaching practice as they embark on a journey of lifelong learning. We plan to measure the impacy of our courses more regularly.
		Opportunities for reflection during training ✓	
		Post programme feedback survey(s) is conducted ✓	
		Progress of teachers are monitored and measured	

	Impact indicators	Feedback on impact is disseminated to stakeholders	*	See below

The AIMSSEC/University of Fort Hare ACE programme is the subject of a three year research and evaluation study by Kellelo Consulting and Professor Jill Adler funded by the Zenex Foundation. The fourth part of the evaluation of our programme was released on 1 June 2015 by Kelello. We are very proud of the many positive aspects highlighted in the report.

The Report Part 3 of the evaluation was released on 13 February 2014. We quote from page 56 of the report:

Table 1: Overview of overall pass, retention and throughput rates for mathematics related courses

	Intermediate Phase (n=26)	Senior Phase (n=`19)	FET (n=27)	Total (n=72)	Total percentage
Pass rate	87%	92%	54%	43	60%
Retention rate	88%	63%	48%	48	67%
Throughput rate	77%	58%	26%	43	60%

Thank you very much for completing this survey!

Annexure 14

Mathematics Skills Development Programme (SDP) Survey

Name of Programme: Mathematics Skills Upgrade Programme

(MATHSUP) offered by the ***Govan Mbeki Mathematics Development***

Unit that is based in the Science Faculty of the NMMU

Programme Leader(s): Prof WA Olivier

Programme History: (number of previous offerings).

MATHSUP Programme was first offered in 2009 with a growing cohort of in-service FET mathematics teachers from the Eastern Cape who have enrolled annually ever since. More than 700 teachers have completed this accredited programme since its inception. The programme was implemented in collaboration with the DBE in the ECP since 2013.

Programme Duration:

- MATHSUP – 2 short learning progrmmes - 6 months each
- GeoGebra Certification – 6 months

Current Programme Accreditation: (if applicable)

The MATHSUP is

- accredited as SLP at the NMMU (12 credits per SLP)

- SACE accredited (30 credits per SLP)
- GeoGebra programme is in the process of being accredited by SACE

Main Beneficiaries: Any in-service mathematics teacher at secondary school level

Short Programme Description:

Each SLP 1 (SLP 2) will focus on Grade 11(Grade 12) topics from the CAPS Mathematics curriculum with the content sessions being aimed at addressing critical areas of need. Selections of specific learning outcomes to be covered in contact sessions, based on priorities identified in consultation with educational authorities, schools and teachers, will be selected from those reflected in CAPS document. However all outcomes will be assessed.

Generic learning outcomes that are linked to all learning topics:

Learners will have

- Meta-cognitive understanding of dependence and relations amongst Learning Topics;
- Knowledge of the structure and relevance of the Grade 10 CAPS curriculum as a support platform for the Grades 11&12 CAPS Mathematics curriculum;
- Knowledge of key field(s) of real life application(s) that are linked to the learning topics of the CAPS Mathematics curriculum;
- A working knowledge of how the CASIO FX scientific calculator could be used as an investigative, calculational and checking device to solve a range of CAPS Mathematics problems.

This SLP will be delivered via a semi-distance model with designated face to face contact periods interspersed with structured assessment opportunities (both summative and formative) and periods of self-study. A techno-blended teaching model will be utilized and an off-line Techno-Blended teaching and learning model will be used to present each SLP.

This model utilizes a combination of curriculum aligned video and PowerPoint content lessons, workbooks, CASIO emulator and exam revision videos in an integrated way to facilitate effective learning. The TouchTutor™ resource material (see * below) will be the resource basis and the lesson presentation mode will mainly be a Laptop PC combined with a data projector.

A typical six-month SLP programme will be made up of 30 formal contact hours followed by informal contact within communities of practice and almost real time support through proven

and innovative technological support. The latter is seen as equivalent to a further 30 contact hours.

The SLP programme schedule includes:

- One day orientation session: Pre-test, Registration, Resource distribution, Scientific Calculator Workshop;
- Five day content contact period in month 1: Structured 6-hour daily programme of content lesson facilitations, tutorials and formative assessments;
- Self-study period during month 2: Learners work independently on a series of Mathematics and ICT assignments;
- Follow-up Friday-afternoon & Saturday contact session in month 3: A formal written SLP test will be taken and a hands-on dynamic graphics software (GeoGebra) technology workshop will be presented;
- Follow-up Friday-afternoon & Saturday contact session in month 4: A structured school learner exam revision model will be presented. MATHSUP learners will be given the opportunity to reflect on and revise the content that was presented during the 5-day contact session for the purpose of preparing themselves for the final SLP examination;
- Formal 3-hour summative written examination in month 5: All the academic content of the SLP will be covered.

Each educator will receive the following SLP- equipment and resources:

- Module information document and complete SLP study guide;
- A laptop with the TouchTutor™ Mathematics package and GeoGebra software pre-installed;
- Additional exercises and model solutions in electronic format.
- Additional exam revision resource material;
- CASIO Scientific Calculator and emulator for Windows.

*The TouchTutor™ Mathematics support package for teachers includes:

- NCS Mathematics Video series that covers the Grade 11 and Grade 12 CAPS Mathematics syllabus. (31 topic videos of 1.5-2 hours each consisting of micro-lessons, tutorials and examples)
- NCS Mathematics Video series that covers the Grade 10 CAPS syllabus. (18 topic videos of 1.5-2 hours each consisting of micro-lessons, tutorials and examples)
- NCS Mathematics Examination Video series: 2008-2012. (8 Videos: NCS National Mathematics Papers 1&2 Exam Question and Solution + Complete Discussion)
- NCS Mathematics CASIO Video series that covers the Grade 11 and Grade 12 syllabus. (Two 2-hour videos that uses an on-screen emulator demonstrates in detail the use of the CASIO FX 82 ZA calculator to solve NCS Maths problems)
- A comprehensive series of learner workbooks and solutions that are aligned with video and PowerPoint content lessons.

If programme brochure, study guide or information document is available in electronic format, please send a copy to waolivier@nmmu.ac.za

Survey on Nature of Mathematics Teacher Development Programme:

Please check ✓ the box(es) that is directly applicable to your Maths development programme.

Please provide relevant comments with each item if applicable.

<table>
<tr><th colspan="3">Profiling of Mathematics Existing Teacher Development Programme</th><th>COMMENTS</th></tr>
<tr><td>F. Content Knowledge Skills and Perspectives</td><td>Learning Outcomes per Grade Level</td><td>
<table>
<tr><td>Please Select (✓) the Content Areas and indicate the Grade Level that applies to your programme</td><td></td><td>Grade Level (e.g. 11-12)</td></tr>
<tr><td>FUNCTIONS</td><td>✓</td><td>10-12</td></tr>
<tr><td>NUMBER PATTERNS, SEQUENCES AND SERIES</td><td>✓</td><td>10-12</td></tr>
<tr><td>FINANCE, GROWTH AND DECAY</td><td>✓</td><td>10-12</td></tr>
<tr><td>ALGEBRA</td><td>✓</td><td>10-12</td></tr>
<tr><td>DIFFERENTIAL CALCULUS</td><td>✓</td><td>10-12</td></tr>
<tr><td>PROBABILITY</td><td>✓</td><td>10-12</td></tr>
<tr><td>EUCLIDEAN GEOMETRY & MEASUREMENT</td><td>✓</td><td>10-12</td></tr>
<tr><td>TRIGONOMETRY</td><td>✓</td><td>10-12</td></tr>
<tr><td>ANALYTICAL GEOMETRY</td><td>✓</td><td>10-12</td></tr>
<tr><td>STATISTICS</td><td>✓</td><td>10-12</td></tr>
<tr><td>OTHER AREA(S)</td><td>✓</td><td>10-12</td></tr>
</table>
</td><td rowspan="2">The MATHSUP programme covers all the topics over a one year period.</td></tr>
<tr><td></td><td>Skills</td><td>
<table>
<tr><td colspan="2">Please indicate which Maths skills are aimed for in your programme</td></tr>
<tr><td>Conceptual Understanding</td><td>✓</td></tr>
</table>
</td><td></td></tr>
</table>

		Procedures & Mathematical Manipulations ✓ Problem Solving Strategies ✓	
	Perspectives	Please indicate which aspects of Maths are being promoted Real Life Applications ✓ Value of Maths in Society ✓	
	Curriculum alignment	Indicate relevant characteristics of your Maths programme content. CAPS aligned ✓ General content topics in Maths ✓ Revision based content ✓	
G. Assesment	***School Based***	Which aspects of assessment are integrated in your programme. Setting of Tests Setting of Exams Homework strategies ✓	Each SLP sees a series of summative and formative assessments which includes tuttests, major tests and a formal 3-hour exam similar to that which is written by Grade 12 learners during the final national exam.
	Extra-school	Assignments Group based assessment	
H. Teaching & Learning	***Pedagogical Skills***	Please select aspects of pedagogy that are included. How, When, What to teach ✓ Classroom activities ✓ Assessment skills ✓	Techno-blended model which is completely offline and Laptop based are being used to promote 21st century pedagogies in practice. .

<table>
<tr>
<td></td>
<td>Technological Skills</td>
<td>
<table>
<tr><td colspan="2">Which technological aspects are included in your Maths programme?</td></tr>
<tr><td>Scientific calculator skills</td><td>✓</td></tr>
<tr><td>Computer & admin software skills.</td><td>✓</td></tr>
<tr><td>Mathematical software skills (e.g. GeoGebra)</td><td>✓</td></tr>
<tr><td>Data projection / presentation skills</td><td></td></tr>
<tr><td>Internet skills</td><td></td></tr>
</table>
</td>
<td>MATHSUP SLP'S also includes integrated ICT training on how, when and where to use technology in teaching mathematics and in their professional work.</td>
</tr>
<tr>
<td></td>
<td>Learners' learning needs</td>
<td>
<table>
<tr><td colspan="2">Please indicate if the programme teaching promote the following:</td></tr>
<tr><td>Learner-centred methods</td><td>✓</td></tr>
<tr><td>Knowledge of self-directed learning</td><td>✓</td></tr>
</table>
</td>
<td></td>
</tr>
<tr>
<td>I. Support</td>
<td>Teaching & Learning Materials</td>
<td>
<table>
<tr><td colspan="2">Please indicate which training materials are distributed.</td></tr>
<tr><td>Textbooks, notes in hardcopy format</td><td>✓</td></tr>
<tr><td>Digital resource material</td><td>✓</td></tr>
<tr><td>Revision/practice material in hard copy format</td><td>✓</td></tr>
</table>
</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Technical Support</td>
<td>
<table>
<tr><td colspan="2">Please indicate the nature of technical support provided.</td></tr>
<tr><td>Equipment like calculators, laptops, tablets</td><td>✓</td></tr>
<tr><td>Internet access and navigation</td><td></td></tr>
<tr><td>Access to Learning Management Systems</td><td></td></tr>
</table>
</td>
<td></td>
</tr>
</table>

<table>
<tr><td></td><td>Learning community</td><td><table><tr><td colspan="2">Please indicate if group work forms part of the training programme.</td></tr><tr><td>Group work during training</td><td>✓</td></tr></table></td><td>Teachers are encouraged to form professional learning communities in their districts</td></tr>
<tr><td>J. Follow up</td><td>Academic coherence and continuity</td><td><table><tr><td colspan="2">Please indicate whether the programme sessions articulate with with each other or with other existing programmes which are similar.</td></tr><tr><td>Articulation exist between successive training sessions or with other similar programmes</td><td>✓</td></tr><tr><td>Academic themes of training sessions are mutually supportive</td><td>✓</td></tr><tr><td>Accumulation of skills and knowledge across the programme is progressive</td><td>✓</td></tr></table></td><td></td></tr>
<tr><td></td><td>QA strategies</td><td><table><tr><td colspan="2">Please indicate whether the following elements are in place:</td></tr><tr><td>Opportunities for reflection during training</td><td>✓</td></tr><tr><td>Post programme feedback survey(s) is conducted</td><td>✓</td></tr><tr><td>Progress of teachers are monitored and measured</td><td></td></tr></table></td><td>A comprehensive survey about various aspects of the SLP programme and related aspects of the impact on personal skills development of the teachers was done after each programme delivery.</td></tr>
<tr><td></td><td>Impact indicators</td><td><table><tr><td>Feedback on impact is disseminated to stakeholders</td><td>*</td></tr></table></td><td>Programme report was circulated to and discussed with DBE with reference to profiles of teacher performances and other salient impact outcomes.</td></tr>
</table>

Mathematics Skills Development Programme (SDP) Survey

Name of Programme: GeoGebra Certification – Basic User

offered by the ***Govan Mbeki Mathematics Development Unit*** that is

based in the Science Faculty of the NMMU

Programme Leader(s): Prof WA Olivier

Programme History: (number of previous offerings).

The GeoGebra certification programme has been offered once as a pilot in 2014 and is currently being registered with SACE.

Programme Duration:

- GeoGebra Certification – five one-day sessions offered over 6 months

Current Programme Accreditation: (if applicable)

- In process of SACE registration

Main Beneficiaries: The programme is intended for FET Mathematics Teachers, preferably who are currently in-service. Ideally participants

should have ready access to a laptop computer which can run GeoGebra and be able to use this computer in a classroom with projection facilities.

Short Programme Description:

A programme orientation session will be followed by an introductory GeoGebra session during which all participants will be introduced to the basic functionalities of the GeoGebra package.
In four subsequent sessions four key areas of the CAPS curriculum will be visited:

Functions and Calculus; Euclidean Geometry; Trigonometry; and Data Handling.

Key concepts of the NCS CAPS curriculum for Maths will be covered for each area.

Basic NCS mathematical content pre-knowledge is assumed. During workshop sessions, the key concepts and results in each content area will be presented by means of the dynamic graphics software programme GeoGebra. These demonstrations will serve to inductively show various approaches to demonstrating mathematical results or concepts in a dynamic visual way.

During each workshop session, relevant basic GeoGebra tools and commands will be covered in order to assist participants to create GeoGebra investigations of their own which demonstrate or explore particular concepts in the content area(s) under consideration.

The GCP will also require participants to complete assignments in which GeoGebra skills and content knowledge will be applied to create an example of a T&L environment for learners to explore an

area chosen by the participant. This stage involves the synthesis of content knowledge, technical skill and pedagogical experience.

Generic learning outcomes that are linked to all learning topics:

Learners will have

- Meta-cognitive understanding of dependence and relations amongst Learning Topics;
- Knowledge of the structure and relevance of the Grade 10 CAPS curriculum as a support platform for the Grades 11&12 CAPS Mathematics curriculum;
- Knowledge of key field(s) of real life application(s) that are linked to the learning topics of the CAPS Mathematics curriculum;
- A working knowledge of how the CASIO FX scientific calculator could be used as an investigative, calculational and checking device to solve a range of CAPS Mathematics problems.

After completion of the GCP, participants should have

- knowledge of key syllabus-aligned mathematical properties/results which can effectively be investigated using Geogebra applets;
- the ability to utilize a Geogebra construction(s) to investigate syllabus-aligned mathematical problem in the classroom;
- the ability to use Geogebra to prepare accurate, well-labelled and suitable mathematical diagrams/graphs to be included in a word-processed assessment(s);
- the ability to plan and implement an investigation to be done with learners with the aid of relevant Geogebra material.
- mastered basic technical GeoGebra skills i.e. Using the Menu System, Toolbox Constructions, Commands, Graphics Editing, Decorations, Textboxes, Sliders and Export of Graphics/Applets.

If programme brochure, study guide or information document is available in electronic format, please send a copy to waolivier@nmmu.ac.za

Survey on Nature of Mathematics Teacher Development Programme:

Please check ✓ the box(es) that is directly applicable to your Maths development programme.

Please provide relevant comments with each item if applicable.

<table>
<tr><th colspan="3">Profiling of Mathematics Existing Teacher Development Programme</th><th>COMMENTS</th></tr>
<tr><td rowspan="2">K. Content Knowledge Skills and Perspectives</td><td>Learning Outcomes per Grade Level</td><td>
<table>
<tr><td>Please Select (✓) the Content Areas and indicate the Grade Level that applies to your programme</td><td></td><td>Grade Level (e.g. 11-12)</td></tr>
<tr><td>FUNCTIONS</td><td>✓</td><td>10-12</td></tr>
<tr><td>NUMBER PATTERNS, SEQUENCES AND SERIES</td><td></td><td>10-12</td></tr>
<tr><td>FINANCE, GROWTH AND DECAY</td><td></td><td>10-12</td></tr>
<tr><td>ALGEBRA</td><td></td><td>10-12</td></tr>
<tr><td>DIFFERENTIAL CALCULUS</td><td>✓</td><td>10-12</td></tr>
<tr><td>PROBABILITY</td><td></td><td>10-12</td></tr>
<tr><td>EUCLIDEAN GEOMETRY & MEASUREMENT</td><td>✓</td><td>10-12</td></tr>
<tr><td>TRIGONOMETRY</td><td>✓</td><td>10-12</td></tr>
<tr><td>ANALYTICAL GEOMETRY</td><td>✓</td><td>10-12</td></tr>
<tr><td>STATISTICS</td><td>✓</td><td>10-12</td></tr>
<tr><td>OTHER AREA(S)</td><td>✓</td><td>10-12</td></tr>
</table>
</td><td>The GCP programme covers four key areas over a six months period.</td></tr>
<tr><td>Skills</td><td>
<table>
<tr><td colspan="2">Please indicate which Maths skills are aimed for in your programme</td></tr>
<tr><td>Conceptual Understanding</td><td>✓</td></tr>
<tr><td>Procedures & Mathematical Manipulations</td><td></td></tr>
</table>
</td><td></td></tr>
</table>

		Problem Solving Strategies ✓	
	Perspectives	Please indicate which aspects of Maths are being promoted Real Life Applications ✓ Value of Maths in Society ✓	
	Curriculum alignment	Indicate relevant characteristics of your Maths programme content. CAPS aligned ✓ General content topics in Maths Revision based content	
L. Assesment	***School Based***	Which aspects of assessment are integrated in your programme. Setting of Tests ✓ Setting of Exams ✓ Homework strategies	
	Extra-school	Assignments Group based assessment	
M. Teaching & Learning	***Pedagogical Skills***	Please select aspects of pedagogy that are included. How, When, What to teach ✓ Classroom activities ✓ Assessment skills ✓	. .
	Technological Skills	Which technological aspects are included in your Maths programme? Scientific calculator skills Computer & admin software skills.	GCP also includes integrated ICT training on how, when and where to use technology in teaching

<table>
<tr><td></td><td></td><td><table><tr><td>Mathematical software skills (e.g. GeoGebra)</td><td>✓</td></tr><tr><td>Data projection / presentation skills</td><td></td></tr><tr><td>Internet skills</td><td></td></tr></table></td><td>mathematics and in their professional work.</td></tr>
<tr><td></td><td>Learners' learning needs</td><td><table><tr><td colspan="2">Please indicate if the programme teaching promote the following:</td></tr><tr><td>Learner-centred methods</td><td>✓</td></tr><tr><td>Knowledge of self-directed learning</td><td></td></tr></table></td><td></td></tr>
<tr><td>N. Support</td><td>Teaching & Learning Materials</td><td><table><tr><td colspan="2">Please indicate which training materials are distributed.</td></tr><tr><td>Textbooks, notes in hardcopy format</td><td>✓</td></tr><tr><td>Digital resource material</td><td>✓</td></tr><tr><td>Revision/practice material in hard copy format</td><td></td></tr></table></td><td></td></tr>
<tr><td></td><td>Technical Support</td><td><table><tr><td colspan="2">Please indicate the nature of technical support provided.</td></tr><tr><td>Equipment like calculators, laptops, tablets</td><td></td></tr><tr><td>Internet access and navigation</td><td></td></tr><tr><td>Access to Learning Management Systems</td><td></td></tr></table></td><td></td></tr>
<tr><td></td><td>Learning community</td><td><table><tr><td colspan="2">Please indicate if group work forms part of the training programme.</td></tr><tr><td>Group work during training</td><td>✓</td></tr></table></td><td>Teachers are encouraged to form professional learning communities in their districts</td></tr>
<tr><td>O. Follow up</td><td>Academic coherence and continuity</td><td><table><tr><td>Please indicate whether the programme sessions articulate with each other or with other</td></tr></table></td><td></td></tr>
</table>

		existing programmes which are similar.		
		Articulation exist between successive training sessions or with other similar programmes	✓	
		Academic themes of training sessions are mutually supportive	✓	
		Accumulation of skills and knowledge across the programme is progressive	✓	
	QA strategies	Please indicate whether the following elements are in place:		A comprehensive survey about various aspects of the GCP programme and related aspects of the impact on personal skills development of the teachers was done after each programme delivery.
		Opportunities for reflection during training	✓	
		Post programme feedback survey(s) is conducted	✓	
		Progress of teachers are monitored and measured	✓	
	Impact indicators	Feedback on impact is disseminated to stakeholders	*	impact outcomes.

Thank you very much for completing this survey!

Annexure 16

Mathematics Skills Development Programme (MSDP) Survey

Name of Programme:

SAMST-PCP Colloquia for Mathematics teachers (IP, SP, FET)

Programme Leader(s):

Prof HD Nieuwoudt, Mr TM Mosiane, Mr MA Tshona

Programme History:

1 Series of three subsequent colloquia (January, May, September 2015); the September colloquium unfortunately did not take place owing to certain unforeseen departmental and school circumstances.

Programme Duration:

1 day, followed by next colloquium three months later

Current Programme Accreditation:

No accreditation as yet; forms part of PSF-activities of the NW-DBE Dr Kenneth Kaunda District (KKD) Office

Main Beneficiaries:

IP, SP and FET Mathematics teachers

Short Programme Description:

The Faculty of Education Sciences of the NWU and the KKD closed an Agreement of Collaboration, under the theme of "Partners in Hope", with the intention of mutual support to improve the quality of teaching and learning in KKD schools. The STEM fields are particularly vulnerable in the district and a colloquium programme was hence started in 2015 to form part of the national SAMST.PCP Initiative to assist teachers in the areas concerned. The (progressive) programme comprised of three one-day colloquia (January, May, September) with a group of teachers who volunteered to participate in the programme. The mathematics sub-programme followed along two streams: one for IP and SP teachers, and one

for FET teachers. The topics being addressed were determined by the needs of the teachers. In 2015 the focus was on geometry (constructions, explorations, proof), statistics (data handling, probability), problem solving and professional collaborative learning (the formation of CoLs/CoPs). All sessions departed from a hands-on (practical) approach and then moved into relevant theoretical grounding of such practices.

As from 2016 the colloquia will form part of the departmental PSF activities for teachers in the district.

Survey on Nature of Mathematics Teacher Development Programme:

Please check ✓ the box(es) that is directly applicable to your Maths development programme.

Please provide relevant comments with each item if applicable.

Profiling of Mathematics Existing Teacher Development Programme					**COMMENTS**
Content Knowledge Skills and Perspectives	***Learning Outcomes per Grade Level***	Please Select (✓) the Content Areas and indicate the Grade Level that applies to your programme		Grade Level (e.g. 11-12)	Participants first collaboratively engaged in practical investigative activities and then in whole-group
		FUNCTIONS			
		NUMBER PATTERNS, SEQUENCES AND SERIES	✓	4-6 7-9	
		FINANCE, GROWTH AND DECAY			
		ALGEBRA			

		DIFFERENTIAL CALCULUS			discussions of their experiences and some theoretical grounding of such practices and its relevance for school situations. During the intervals between colloquia teachers were expected to collaborative plan and try out some of the ideas leaned and then to report and reflect on those experiences at the next session.
		PROBABILITY	✓	10-12	
		EUCLIDEAN GEOMETRY & MEASUREMENT	✓	4-6 7-9 10-12	
		TRIGONOMETRY			
		ANALYTICAL GEOMETRY	✓	10-12	
		STATISTICS AND DATA HANDLING	✓	4-6 7-9 10-12	
		OTHER AREA(S)			
	Skills	Please indicate which Maths skills are aimed for in your programme			Practical engagement with tasks and problem solving.
		Conceptual Understanding	✓		
		Procedures & Mathematical Manipulations	✓		
		Problem Solving Strategies	✓		
	Perspectives	Please indicate which aspects of Maths are being promoted			Reflecting on and sharing own
		Real Life Applications	✓		
		Value of Maths in Society	✓		

<table>
<tr><td></td><td></td><td></td><td>experiences.</td></tr>
<tr><td></td><td>Curriculum alignment</td><td><table><tr><td colspan="2">Indicate relevant characteristics of your Maths programme content.</td></tr><tr><td>CAPS aligned</td><td>✓</td></tr><tr><td>General content topics in Maths</td><td>✓</td></tr><tr><td>Revision based content</td><td>✓</td></tr></table></td><td>Topics selected on the basis of teachers' needs with regard to most critical gaps identified in ANAs/NSC exams.</td></tr>
<tr><td>Assessment</td><td>School Based</td><td><table><tr><td colspan="2">Which aspects of assessment are integrated in your programme.</td></tr><tr><td>Setting of Tests</td><td>✓</td></tr><tr><td>Setting of Exams</td><td>✓</td></tr><tr><td>Homework strategies</td><td>✓</td></tr></table></td><td></td></tr>
<tr><td></td><td>Extra-school</td><td><table><tr><td>Assignments</td><td></td></tr><tr><td>Group based assessment</td><td></td></tr></table></td><td></td></tr>
<tr><td>Teaching & Learning</td><td>Pedagogical Skills</td><td><table><tr><td colspan="2">Please select aspects of pedagogy that are included.</td></tr><tr><td>How, When, What to teach</td><td>✓</td></tr><tr><td>Classroom activities</td><td>✓</td></tr><tr><td>Assessment skills</td><td>✓</td></tr></table></td><td></td></tr>
<tr><td></td><td>Technological Skills</td><td><table><tr><td colspan="2">Which pedagogy aspects are included in your Maths programme?</td></tr><tr><td>Scientific calculator skills</td><td>✓</td></tr><tr><td>Computer & admin software skills.</td><td></td></tr><tr><td>Mathematical software skills (e.g. GeoGebra)</td><td>✓</td></tr><tr><td>Data projection / presentation skills</td><td></td></tr><tr><td>Internet skills</td><td></td></tr></table></td><td></td></tr>
<tr><td></td><td>Learners' learning needs</td><td><table><tr><td colspan="2">Please indicate if the programme teaching promote the following:</td></tr><tr><td>Learner-centred methods</td><td>✓</td></tr><tr><td>Knowledge of self-directed learning</td><td>✓</td></tr></table></td><td></td></tr>
</table>

<table>
<tr>
<td rowspan="3">Support</td>
<td>Teaching & Learning Materials</td>
<td>
<table>
<tr><td colspan="2">Please indicate which training materials are distributed.</td></tr>
<tr><td>Textbooks, notes in hardcopy format</td><td>✓</td></tr>
<tr><td>Digital resource material</td><td>✓</td></tr>
<tr><td>Revision/practice material in hard copy format</td><td>✓</td></tr>
</table>
</td>
<td>Participants received activities and support material in hard copy, together with a CD containing the PPT presentations and work sheets used, Geogebra (portable) and links to relevant internet sources on.</td>
</tr>
<tr>
<td>Technical Support</td>
<td>
<table>
<tr><td colspan="2">Please indicate the nature of technical support provided.</td></tr>
<tr><td>Equipment like calculators, laptops, tablets</td><td></td></tr>
<tr><td>Internet access and navigation</td><td></td></tr>
<tr><td>Access to Learning Management Systems</td><td></td></tr>
</table>
</td>
<td></td>
</tr>
<tr>
<td>Learning community</td>
<td>
<table>
<tr><td colspan="2">Please indicate if group work forms part of the training programme.</td></tr>
<tr><td>Group work during training</td><td>✓</td></tr>
</table>
</td>
<td></td>
</tr>
<tr>
<td>PP. Follow up</td>
<td>Academic coherence and continuity</td>
<td>
<table>
<tr><td colspan="2">Please indicate whether the programme sessions articulate with each other or with other existing programmes which are similar.</td></tr>
<tr><td>Articulation exist between successive training sessions or with other similar programmes</td><td>✓</td></tr>
<tr><td>Academic themes of training sessions are mutually supportive</td><td>✓</td></tr>
<tr><td>Accumulation of skills and knowledge across the programme is progressive</td><td>✓</td></tr>
</table>
</td>
<td></td>
</tr>
</table>

	QA strategies	Please indicate whether the following elements are in place:	
		Opportunities for reflection during training	✓
		Post programme feedback survey(s) is conducted	✓
		Progress of teachers are monitored and measured	
	Impact indicators	Feedback on impact is disseminated to stakeholders	✓

Thank you very much for completing this survey!

Annexure 17

Mathematics Skills Development Programme (MSDP) Survey

Name of Programme:

Short Learning Programme (SLP) for Subject Specialists in Mathematics

(Intermediate and Senior Phase)

Programme Leader(s):

Prof. HD Nieuwoudt & Dr. A Roux

Programme History:

2 (2014, 2015)

Programme Duration:

3 days

Current Programme Accreditation:

NWU approved Short Learning Programme; SACE accredited for CTPD purposes

Main Beneficiaries:

Subject Specialists in Mathematics (Intermediate and Senior Phase) of the North West Department of Basic Education (NW-DBE)

Short Programme Description:

The NW-DBE contracted the three-day SLP for all the subject specialists concerned to assist them in being able to more purposefully and effectively support IP and SP mathematics teachers with regard to their conceptual understanding and teaching of topics that have shown in the ANAs to be most problematic in NW schools. This SLP specifically addressed geometry, number patterns, fractions, operations with numbers, data handling, word problems and problem solving, departing from a hands-on (practical) approach and then moving into relevant theoretical grounding of such practices.

The intention further was that the NW-DBE would have coordinated some follow-up with the subject specialists after they had had opportunity to engage with teachers – this unfortunately did not realise.

If programme brochure, study guide or information document is available in electronic format, please send a copy to waolivier@nmmu.ac.za

Survey on Nature of Mathematics Teacher Development Programme:

Please check ✓ the box(es) that is directly applicable to your Maths development programme.

Please provide relevant comments with each item if applicable.

Profiling of Mathematics Existing Teacher Development Programme					**COMMENTS**
Content Knowledge Skills and Perspectives	***Learning Outcomes per Grade Level***	Please Select (✓) the Content Areas and indicate the Grade Level that applies to your programme		Grade Level (e.g. 11-12)	Participants first collaboratively engaged in practical investigative activities and then in whole-group discussions of their experiences and some theoretical grounding of
		FUNCTIONS			
		NUMBER PATTERNS, SEQUENCES AND SERIES	✓	4-6 7-9	
		FINANCE, GROWTH AND DECAY			
		ALGEBRA			
		DIFFERENTIAL CALCULUS			
		PROBABILITY			
		EUCLIDEAN GEOMETRY & MEASUREMENT	✓	4-6 7-9	
		TRIGONOMETRY			
		ANALYTICAL GEOMETRY			
		STATISTICS AND DATA HANDLING	✓	4-6 7-9	
		OTHER AREA(S)			

			such practices and its relevance for school situations.
	Skills	Please indicate which Maths skills are aimed for in your programme	Practical engagement with tasks and problem solving.
		Conceptual Understanding ✓	
		Procedures & Mathematical Manipulations ✓	
		Problem Solving Strategies ✓	
	Perspectives	Please indicate which aspects of Maths are being promoted	Reflecting on and sharing own experiences.
		Real Life Applications ✓	
		Value of Maths in Society ✓	
	Curriculum alignment	Indicate relevant characteristics of your Maths programme content	Topics selected on the basis of most critical gaps identified in ANAs.
		CAPS aligned ✓	
		General content topics in Maths ✓	
		Revision based content ✓	
K. Assessment	***School Based***	Which aspects of assessment are integrated in your programme.	
		Setting of Tests ✓	
		Setting of Exams ✓	
		Homework strategies ✓	
	Extra-school	Assignments	
		Group based assessment	

L. Teaching & Learning	***Pedagogical Skills***	Please select aspects of pedagogy that are included.	
		How, When, What to teach	✓
		Classroom activities	✓
		Assessment skills	✓
	Technological Skills	Which pedagogy aspects are included in your Maths programme?	
		Scientific calculator skills	✓
		Computer & admin software skills.	
		Mathematical software skills (e.g. GeoGebra)	✓
		Data projection / presentation skills	
		Internet skills	
	Learners' learning needs	Please indicate if the programme teaching promote the following:	
		Learner-centred methods	✓
		Knowledge of self-directed learning	✓
M. Support	***Teaching & Learning Materials***	Please indicate which training materials are distributed.	Participants received a comprehensive file containing all course material and selected additional/supplementary support material in hard copy, together with a CD containing the PPT presentations and work sheets used, Geogebra (portable) and links to relevant internet sources on.
		Textbooks, notes in hardcopy format	✓
		Digital resource material	✓
		Revision/practice material in hard copy format	✓
	Technical Support	Please indicate the nature of technical support provided.	
		Equipment like calculators, laptops, tablets	
		Internet access and navigation	
		Access to Learning Management Systems	

	Learning community	Please indicate if group work forms part of the training programme.		
		Group work during training		✓
N. Follow up	***Academic coherence and continuity***	Please indicate whether the programme sessions articulate with each other or with other existing programmes which are similar.		
		Articulation exist between successive training sessions or with other similar programmes		✓
		Academic themes of training sessions are mutually supportive		✓
		Accumulation of skills and knowledge across the programme is progressive		✓
	QA strategies	Please indicate whether the following elements are in place:		
		Opportunities for reflection during training		✓
		Post programme feedback survey(s) is conducted		✓
		Progress of teachers are monitored and measured		
	Impact indicators	Feedback on impact is disseminated to stakeholders		✓

Thank you very much for completing this survey!

Annexure 18

Mathematics Skills Development Programme (MSDP) Survey

Name of Programme:

Short Learning Programme for Subject Specialists in Mathematics

(Foundation Phase)

Programme Leader(s):

Dr HM van Niekerk

Programme History:

2 (2014, 2015)

Programme Duration:

3 days

Current Programme Accreditation:

NWU approved Short Learning Programme; SACE accredited for CTPD purposes

Main Beneficiaries:

Subject Specialists in Mathematics (Foundation Phase)

Short Programme Description:

The NW-DBE contracted the three-day SLP for all the subject specialists concerned to assist them in being able to more purposefully and effectively support FP mathematics teachers with regard to their conceptual understanding and teaching of topics that have shown in the ANAs to be most problematic in NW schools. This SLP specifically addressed geometry and spatial development, number patterns, operations with numbers, word problems and problem solving, departing from a hands-on (practical) approach and then moving into relevant theoretical grounding of such practices.

The intention further was that the NW-DBE would have coordinated some follow-up with the subject specialists after they had had opportunity to engage with teachers – this unfortunately did not realise.

If programme brochure, study guide or information document is available in electronic format, please send a copy to waolivier@nmmu.ac.za

Survey on Nature of Mathematics Teacher Development Programme:

Please check ✓ the box(es) that is directly applicable to your Maths development programme.

Please provide relevant comments with each item if applicable.

Profiling of Mathematics Existing Teacher Development Programme					**COMMENTS**
Content Knowledge Skills and Perspectives	***Learning Outcomes per Grade Level***	Please Select (✓) the Content Areas and indicate the Grade Level that applies to your programme		Grade Level (e.g. 11-12)	Participants first collaboratively engaged in practical investigative activities and then in whole-group discussions of their experiences and some theoretical grounding of such practices and its relevance for school situations.
		FUNCTIONS			
		NUMBER PATTERNS, SEQUENCES AND SERIES	✓	4-6 7-9	
		FINANCE, GROWTH AND DECAY			
		ALGEBRA			
		DIFFERENTIAL CALCULUS			
		PROBABILITY			
		EUCLIDEAN GEOMETRY & MEASUREMENT	✓	4-6 7-9	
		TRIGONOMETRY			
		ANALYTICAL GEOMETRY			
		STATISTICS AND DATA HANDLING	✓	4-6 7-9	

		OTHER AREA(S)			
	Skills	Please indicate which Maths skills are aimed for in your programme			Practical engagement with tasks and problem solving.
		Conceptual Understanding	✓		
		Procedures & Mathematical Manipulations	✓		
		Problem Solving Strategies	✓		
	Perspectives	Please indicate which aspects of Maths are being promoted.			Reflecting on and sharing own experiences.
		Real Life Applications	✓		
		Value of Maths in Society	✓		
	Curriculum alignment	Indicate relevant characteristics of your Maths programme/ content.			Topics selected on the basis of most critical gaps identified in ANAs.
		CAPS aligned	✓		
		General content topics in Maths	✓		
		Revision based content	✓		
Assessment	***School Based***	Which aspects of assessment are integrated in your programme.			
		Setting of Tests	✓		
		Setting of Exams	✓		
		Homework strategies	✓		
	Extra-school	Assignments			
		Group based assessment			

Teaching & Learning	***Pedagogical Skills***	Please select aspects of pedagogy that are included.	
		How, When, What to teach	✓
		Classroom activities	✓
		Assessment skills	✓
	Technological Skills	Which pedagogy aspects are included in your Maths programme?	
		Scientific calculator skills	✓
		Computer & admin software skills.	
		Mathematical software skills (e.g. GeoGebra)	✓
		Data projection / presentation skills	
		Internet skills	
	Learners' learning needs	Please indicate if the programme teaching promote the following:	
		Learner-centred methods	✓
		Knowledge of self-directed learning	✓
Support	***Teaching & Learning Materials***	Please indicate which training materials are distributed.	Participants received a comprehensive file containing all course material and selected additional/supplementary support material in hard copy, together with a CD containing the PPT presentations and work sheets used, Geogebra (portable) and links to relevant internet sources on.
		Textbooks, notes in hardcopy format	✓
		Digital resource material	✓
		Revision/practice material in hard copy format	✓
	Technical Support	Please indicate the nature of technical support provided.	
		Equipment like calculators, laptops, tablets	
		Internet access and navigation	
		Access to Learning Management Systems	
	Learning community	Please indicate if group work forms part of the training programme.	
		Group work during training	✓

Follow up	***Academic coherence and continuity***	Please indicate whether the programme sessions articulate with each other or with other existing programmes which are similar.	
		Articulation exist between successive training sessions or with other similar programmes	✓
		Academic themes of training sessions are mutually supportive	✓
		Accumulation of skills and knowledge across the programme is progressive	✓
	QA strategies	Please indicate whether the following elements are in place:	
		Opportunities for reflection during training	✓
		Post programme feedback survey(s) is conducted	✓
		Progress of teachers are monitored and measured	
	Impact indicators	Feedback on impact is disseminated to stakeholders	✓

Thank you very much for completing this survey!

Annexure 19

Mathematics Skills Development Programme (MSDP) Survey

Name of Programme:

Short Learning Programme for FET Mathematics teachers

Programme Leader(s):

Dr A Roux & Dr HM van Niekerk

Programme History:

1 (2015)

Programme Duration:

3 days plus 1 day (two/three months later)

Current Programme Accreditation:

NWU approved Short Learning Programme; SACE accredited for CTPD purposes

Main Beneficiaries:

FET Mathematics teachers

Short Programme Description:

The NW-DBE contracted the three-day SLP for FET mathematics teachers to assist them in being able to more purposefully and effectively teach mathematics topics that have shown in the ANAs to be most problematic in NW schools. This SLP specifically addressed Euclidean geometry, statistics and probability, word problems and problem solving, departing from a hands-on (practical) approach and then moving into relevant theoretical grounding of such practices.

If programme brochure, study guide or information document is available in electronic format, please send a copy to waolivier@nmmu.ac.za

Survey on Nature of Mathematics Teacher Development Programme:

Please check ✓ the box(es) that is directly applicable to your Maths development programme.

Please provide relevant comments with each item if applicable.

<table>
<tr><th colspan="3">Profiling of Mathematics Existing Teacher Development Programme</th><th>COMMENTS</th></tr>
<tr><td>O. Content Knowledge Skills and Perspectives</td><td>Learning Outcomes per Grade Level</td><td>
<table>
<tr><th>Please Select (✓) the Content Areas and indicate the Grade Level that applies to your programme</th><th></th><th>Grade Level (e.g. 11-12)</th></tr>
<tr><td>FUNCTIONS</td><td></td><td></td></tr>
<tr><td>NUMBER PATTERNS, SEQUENCES AND SERIES</td><td></td><td></td></tr>
<tr><td>FINANCE, GROWTH AND DECAY</td><td></td><td></td></tr>
<tr><td>ALGEBRA</td><td></td><td></td></tr>
<tr><td>DIFFERENTIAL CALCULUS</td><td></td><td></td></tr>
<tr><td>PROBABILITY</td><td>✓</td><td>10-12</td></tr>
<tr><td>EUCLIDEAN GEOMETRY & MEASUREMENT</td><td>✓</td><td>10-12</td></tr>
<tr><td>TRIGONOMETRY</td><td></td><td></td></tr>
<tr><td>ANALYTICAL GEOMETRY</td><td></td><td></td></tr>
<tr><td>STATISTICS AND DATA HANDLING</td><td>✓</td><td>10-12</td></tr>
<tr><td>OTHER AREA(S)</td><td></td><td></td></tr>
</table>
</td><td>Participants first collaboratively engaged in practical investigative activities and then in whole-group discussions of their experiences and some theoretical grounding of such practices and its relevance for school situations.</td></tr>
<tr><td></td><td>Skills</td><td>
<table>
<tr><th colspan="2">Please indicate which Maths skills are aimed for in your programme</th></tr>
<tr><td>Conceptual Understanding</td><td>✓</td></tr>
<tr><td>Procedures & Mathematical Manipulations</td><td>✓</td></tr>
</table>
</td><td>Practical engagement with tasks</td></tr>
</table>

<table>
<tr><td></td><td></td><td><table><tr><td>Problem Solving Strategies</td><td>✓</td></tr></table></td><td>and problem solving.</td></tr>
<tr><td></td><td>Perspectives</td><td><table><tr><td colspan="2">Please indicate which aspects of Maths are being promoted</td></tr><tr><td>Real Life Applications</td><td>✓</td></tr><tr><td>Value of Maths in Society</td><td>✓</td></tr></table></td><td>Reflecting on and sharing own experiences.</td></tr>
<tr><td></td><td>Curriculum alignment</td><td><table><tr><td colspan="2">Indicate relevant characteristics of your Maths programme content.</td></tr><tr><td>CAPS aligned</td><td>✓</td></tr><tr><td>General content topics in Maths</td><td>✓</td></tr><tr><td>Revision based content</td><td>✓</td></tr></table></td><td>Topics selected on the basis of most critical gaps identified in ANAs.</td></tr>
<tr><td>P. Assessment</td><td>School Based</td><td><table><tr><td colspan="2">Which aspects of assessment are integrated in your programme.</td></tr><tr><td>Setting of Tests</td><td>✓</td></tr><tr><td>Setting of Exams</td><td>✓</td></tr><tr><td>Homework strategies</td><td>✓</td></tr></table></td><td></td></tr>
<tr><td></td><td>Extra-school</td><td><table><tr><td>Assignments</td><td></td></tr><tr><td>Group based assessment</td><td></td></tr></table></td><td></td></tr>
</table>

Q. Teaching & Learning	***Pedagogical Skills***	Please select aspects of pedagogy that are included.	
		How, When, What to teach	✓
		Classroom activities	✓
		Assessment skills	✓
	Technological Skills	Which pedagogy aspects are included in your Maths programme?	
		Scientific calculator skills	✓
		Computer & admin software skills.	
		Mathematical software skills (e.g. GeoGebra)	✓
		Data projection / presentation skills	
		Internet skills	
	Learners' learning needs	Please indicate if the programme teaching promote the following:	
		Learner-centred methods	✓
		Knowledge of self-directed learning	✓
R. Support	***Teaching & Learning Materials***	Please indicate which training materials are distributed.	Participa containi addition in hard c the PPT Geogebr internet
		Textbooks, notes in hardcopy format	✓
		Digital resource material	✓
		Revision/practice material in hard copy format	✓
	Technical Support	Please indicate the nature of technical support provided.	
		Equipment like calculators, laptops, tablets	
		Internet access and navigation	
		Access to Learning Management Systems	
	Learning community	Please indicate if group work forms part of the training programme.	
		Group work during training	✓
S. Follow up	***Academic coherence and continuity***	Please indicate whether the programme sessions articulate with each other or with other existing programmes which are similar.	
		Articulation exist between successive training sessions or with other similar programmes	✓
		Academic themes of training sessions are mutually supportive	✓
		Accumulation of skills and knowledge across the programme is progressive	✓

	QA strategies	Please indicate whether the following elements are in place:	
		Opportunities for reflection during training	✓
		Post programme feedback survey(s) is conducted	✓
		Progress of teachers are monitored and measured	
	Impact indicators	Feedback on impact is disseminated to stakeholders	✓

Thank you very much for completing this survey!