

***Rolling out a sustainable program
to upgrade statistics knowledge of
in-service teachers through a
TEAMWORK approach in South
Africa***

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My involvement in Statistics education

Lecturer at university: over 30 years

Training of teachers

- * design of statistics content of school syllabus
- * maths4stats program: Stats SA

STATISTICS EDUCATION AND OUTREACH

School/University Interface activity that

- * encourages students to take statistics at university
- * promotes a statistically literate society

Statistics teaching at school level in South Africa: CHALLENGES

Problems much like all over the world, but magnified!

Teachers

- * not adequately trained
- * lack of statistics interpretation skills

Problems particular to South Africa

- * Shortage of teachers, large classes (Apartheid)
- * Shortage of funds for training teachers
- * multiple languages, very large classes
- * poor facilities at schools



Putting into perspective

So, we have a problem with teaching of Statistics at school level in South Africa but why do university Statistics lecturers need be concerned with this problem?

University statistics lecturers

- Teach
- Research
- Engage in community service
- Largest component of time
- Most pressure from university
- Very little recognition by universities

International Panel Findings

*Statistics Research is now at a stage that is so critical that the field is in **danger of disappearing** through lack of academic capacity. The **closure of academic departments** is a real possibility. The crisis in statistics must be urgently addressed if its existence into the future is to be assured.*

- **Too few academic statisticians in the system,** and the age profile of those who are active is heavily weighted in the 55+ age-group
- **Difficult to attract capable students to study statistics** in particular at the honours, masters and doctoral levels.

Recommendations

Capacity development: interconnectivity, and strengthening of foundations

More students to enter at **grass roots level** and work collectively to **find ways to excite them about Statistics...**but we need to be sure that **Statistics is not so badly taught** that they do not want to do it!

ICMI/IASE Joint Study, Mexico 2008

Statisticians have a critical role to play in training teachers to meaningfully teach Data and Probability at school level

Teacher Training: maths4stats project

Initiated by Statistics South Africa in 2007

Aims: encourage the development basic statistics skills needed by teachers to cope with the Data Handling component of the school syllabus.

- * Statistics is part of everyday life
- * acquisition of sufficient skills
in statistics and mathematics to enter into
further training in Science/Engineering
- * *Statistics as a discipline in it's own right,
with many, many opportunities for study
and employment.*

maths4stats progress

1) Master trainers: Delia North & Jackie Scheiber

- * Wrote materials

- * Trained teachers

2) Specialized group of Maths teachers (Maths4stats coordinators) were trained and employed by Stats SA to coordinate Statistics workshops for in-service Mathematics school teachers in the various provinces

Conducted many workshops



Great excitement when schools are visited



Fast track maths4stats....

All provinces, maths4stats provincial coordinators (seated in Stats SA provincial offices) run workshops – collaborate with DOE.

Sheer magnitude of the number of teachers that need training across South Africa is a very daunting task and we needed to think of a way to train more teachers, more effectively.

UKZN maths4stats lecture series

Recognition of the opportunity that it presents for universities to sell the power of Statistics to teachers from their catchment area, lead UKZN to take the launch a campaign to upgrade Statistics skills of teachers in KZN through the maths4stats campaign.

Main Elements: UKZN maths4stats lecture series

1. joint initiative: UKZN, DOE & Stats SA
2. presented in a way that involves the whole Statistics Department
3. carefully planned so as not to be too time consuming for staff so that it may be sustainable and be presented annually.

KZN maths4stats lecture series

Role Played

DOE

- * Identifies teachers
- * Sends out flyers to schools

STATS SA

- * Handles full registration process
- * Responsible for logistics – signage, tea, communication

UNIVERSITY

- * Provides venue
- * Provides materials
- * Provides lecturers

KZN maths4stats lecture series

GAINS

University

- * Marketing in catchment area
- * Discipline capacity building
- * community service for academics

DOE

- * Statistics Training for teachers at no cost
- * Identify teachers from schools that are desperately in need of training

Stats SA

- * promoting success of the maths4stats campaign by assisting maths4stats provincial coordinators

Exactly how it is done?

- (1) DOE identifies schools/teachers
- (2) Teachers register with Stats SA

No registration fee but reply slip (reference no) essential to gain entry to the workshops

A CALL FOR TEACHERS IN GRADES 7-9 AND GRADES 10-12 TO REGISTER

What is Maths4stats KZN Lecture Series?

It is an initiative undertaken by Provincial Stats SA (Maths4stats Project) in collaboration with the KZN Education Department and UKZN School of Statistics and Actuarial Science lecturers, to offer a series of statistical education workshops consistent with the National Curriculum Statement, to Mathematics and Mathematical Literacy educators in both the GET and FET levels.

Each one of the lectures will have two parallel sessions: One for GET and another for FET. For the maiden year (i.e. 2010) of **M4S KZN Lectures**, the focus on FET phase will be on data handling's **core assessment standards**, which forms basis for topics and concepts covered by compulsory Mathematics Examination Paper 2.

Successive lectures from 2011 onwards will then have additional Lectures on **optional assessment standards** running parallel with sessions on **core assessment standards** for the new intake of teachers.

Where and when are these M4S KZN Lecture Series taking place?

There will be one lecture per month, for the first five months of 2010. These lectures will run on **Saturdays**, from 08h00 until 12h30, Venues for the lectures will alternate between **UKZN Howard College** in Durban and **UKZN Pietermaritzburg Campus**. The same lectures will be repeated on the other campus as this will allow educators who might have missed one lecture in one venue, a chance to attend it in the other venue.

See the registration form for details, registration process and dates for the 2010 program.

The program will run from January until June of every year, dates of lectures will be advertised at the start of each year.

What is expected from educators with interest to attend?

There is **no charge** for this training, but delegates **have to register prior to 11 December 2009** in order to attend, indicating where and which lectures will they manage to attend.

You fail to register, you don't attend and no gate crashers will be allowed!!

Details for registration are as follows:

- (1) Fill in the registration form which appears at the end of this document
- (2) Fax or email it as directed on the form **before 11 December 2009**.
- (3) Ensure that you get a **reply slip confirming acceptance** as you will need it to get into the Howard College or PMB Campus

Certificate of attendance will be provided only to those who have completed all lectures per year. If for some reasons you don't complete all 5 lectures, then you can attend the ones you have missed in the successive years for eligibility of certificate as it is only issued once the whole course is attended..

NB: Your fax number or email address is very important to us. Please provide these details so that we issue you a **REPLY SLIP / CONFIRMATION LETTER** with precise location of venues at the two campuses.

The reply slip will also serve as a proof for acceptance and has to be produced at the entrance.

TEACHER REGISTRATION FORM
MATHS4STATS KZN LECTURES: DURBAN & PIETERMARITZBURG 2010

DELEGATE DETAILS		
TITLE, NAME & SURNAME:		
INSTITUTION/SCHOOL NAME AND DISTRICT:		
POSTAL ADDRESS		
TELEPHONE AND CELLPHONE NUMBER:		
FAX NUMBER:		
EMAIL ADDRESS:		
REGISTER FOR FET WORKSHOPS AT UKZN EDGEWOOD CAMPUS (PINETOWN): For 2010		
Date	Topics to be done	Tick (X) Lectures to attend
Lesson 1: 23 January	Stem & leaf plots; Box-and-whisker plots; averages of ungrouped data and selecting the most appropriate under given conditions and measures of dispersion: range, quartiles, etc.	
Lesson 2: 13 February	The interpretation of Medians, Quartiles and Percentiles in Maths and Maths Literacy. Interpretation of Box-and-whisker diagram.	
Lesson 3: 13 March	Using a calculator for a mean; finding variance & standard deviation manually and with a calculator; the standard deviation and the mean.	
Lesson 4: 17 April	Measures of central tendency of grouped data, frequency tables, discrete & continuous data; bar graphs; histograms, frequency polygons.	
Lesson 5: 08 May	Cumulative frequency, Ogives and other related concepts	
OR REGISTER FOR FET WORKSHOPS AT UKZN PMB CAMPUS:		
Date	Topics to be done	Tick (X) Lectures to attend
Lesson 1: 30 January	Stem & leaf plots, Box-and -whisker plots (concept & interpretation), averages, selecting the most appropriate average under given conditions and measures dispersion (concept & interpretation): range, quartiles, etc.	
Lesson 2: 20 February	The interpretation of Medians, Quartiles and Percentiles.	
Lesson 3: 20 March	Using a calculator for a mean; finding variance & standard deviation manually and with a calculator; the standard deviation and the mean.	
Lesson 4: 24 April	Measures of central tendency of grouped data, bar graphs, histograms, frequency polygons	
Lesson 5: 15 May	Cumulative frequency, Ogives and other related concepts	
Completed registration form should be faxed or emailed to the following person: Name: Lusanda Mkwenkweni Fax Number: (031) 305 9939 OR 086 528 6915 Email Address: Lusandamk@statssa.gov.za Enquiries: (031) 3600 600 ext 618 (tel) OR 082 803 9132 (cell)		

Colour coded tags



Extensive records are kept

FET PROBABILITY AND FINANCIAL MATHEMATICS - PMB 2011

No	District	School name	Surname	Name	Gender	Tel	Fax	Cell phone	E-mail
1	Empangeni	Gqokinsimbi	Ngema	R Zanele	F	035 474 8152	031 305 9939	082 225 4353	
2	Empangeni	Nqundu Combined	Sibiya	Mabusi C.	Female	034 622 5577 / 084 4151 772			
3	Ilembe	Kranskop High	Nxumalo	Simphiwe L		072 327 3896		PO Box 57 Kranskop 3268	
4	Ilembe	Our Lady of Rosary	Khuzwayo	Shongani Anna-Victoria	F	033 506 0089	033 506 0098	072 511 0732	khuzwayosho@yahoo.com
5	Othukela	Ngcongcosi-Bethany	Dladla	McDonald B.	Male			083 366 7743	
6	Othukela	Thabane Secondary	Hlone	Nokusa Sylvia	Female			078 375 0614	
7	Othukela	Themabela high	Zulu	Hlengiwe A	Female			072 419 8696	
8	Pinetown	Lockhat High School	Mbonambi	Sipho M	M	032 541 0008		083 550 5455	0835505455@mtnloaded.co.za
9	Sisonke	Carl Malcomes Secondary	Mandiwanzira	John	Male		039 7272801	071 407 2391	
10	Sisonke	Carl Malcomess High	Kwarteng	Kofi Richard	M	039 727 2853	039 727 2801	078 520 3386	Richkofey2003@yahoo.com
11	Sisonke	Carl Malcomess High	Tau	Lillo	M	039 727 2801	039 727 2801	083 570 1915	
12	Sisonke	Ekhokhwane School	Mzizi	NP	F			078 694 8509	
13	Sisonke	Franklin Sec.	Gammah	Ebenezer	M	039 747 4321	073 832 8378	039 747 4321	
14	Sisonke	Mabandla SS	Moto	TG	M			072 707 6982	
15	Sisonke	Mandlezizwe High	Sosibo	Robert Msawenkosi	Male	039 832 0500	039 832 0050	072 143 8457	www.rmsos@ovi.com
16	Sisonke	Mount Currie SSS	De Kock	Erica M	F	073 647 1202	039 727 3662		urbandk@telkomsa.net
17	Sisonke	Ntabende High	Mthethwa	DC	Male			072 820 1857	
18	Ugu	Mdibaniso Combined	Ntshiza	Vuyisile Ignatia	Female	039 835 8452	039 835 8452 / 039 835 8089	073 256 9706	
19	Umgungundlovu	Albert Falls school	Mchunu	Khumbulile			033 369 1540	074 222 1190	
20	Umgungundlovu	Asithuthuke Comb.	Mnguni	NE	Female	072 916 3675	033 234 4428		
21	Umgungundlovu	Bhekuximba	Mncwabe	Thokozile Mosley	Female	072 241 5782	033 505 0779		
22	Umgungundlovu	C21 private	Moodley	Amy	F	033 397 0619	033 391 5476		
23	Umgungundlovu	Ekhokhwane School	Zulu			033 997 1967		078 558 5332	
24	Umgungundlovu	Fundokuhle Sec School	Mamane	Bukiswa	F	033 398 3329	033 598 1958	082 482 0741	buki@ananzi.co.za
25	Umgungundlovu	Fundokuhle Sec School	Shange	LA	F	033 278 1958	033 398 1958	079 346 7464	
26	Umgungundlovu	Gobindlovu High	Phungula	Jerome Mzothule	Male	082 335 8219	033 926 1964		
27	Umgungundlovu	Howick Sec.	Girdhary	S	M	033 330 5393	033 330 5393	082 8000 650	s.girdhary@webmail.co.za
28	Umgungundlovu	Ikusaselihle High	Madondo	Gloria Duduzile	Female	084 7232632	033 3210009		
29	Umgungundlovu	Imbali JS School	Myeza	PHD	F	033 393 2945	033 393 2945	083 478 3167	myzaph@telkomsa.net

Registration Table -> Lecture room

- Lessons are presented by UKZN Statistics staff in university lecture rooms
- Tea and Lunches are staggered
- Notes for lessons are provided daily by the school (stapled set)

Teachers travel long distances at own cost to attend Saturday classes



UKZN tutors are a great help



Teachers that attend all lessons are given

- CASIO calculator workshop
- Full set of bound notes (all lessons)
- Certificate of attendance, signed jointly by DOE, UKZN and Stats SA.

Program: Certification Day 2010

	FET Session	GET Session	
08:30am	Lesson 5	Casio workshop	UKZN and Casio
10:00am		Tea	Stats SA
10:30am	Tea	Lesson 5	Stats SA and UKZN
11:00am	Casio		Casio
12:30pm	Award Ceremony		
	Introductions of Guests		Ms N. Makhatha (Stats SA)
	Background to the Project		Prof. D. North
	Address by SG: Stats SA		Mr. Palli Lehohla
	Address by Dept. of Education		DOE Provincial head
	Address by dean of Science		Prof. D. Jeogani
	Awarding of certificates		Ms N. Makhatha
	Closing		Prof. D. North
02:00pm	Lunch		ALL

UKZN :Repeat lessons on 2 campuses

	PmB	Howard C	Total
GET: Grade R – 9	92 (56)	135 (82)	227 (138)
FET: Grade 10 -12	91 (55)	60 (41)	151 (96)
Paper 3: Fin Maths and Prob	100 (64)	80 (48)	180 (112)

Certification was attended by dignitaries from DOE, UKZN and Stats SA



How do the teachers react

At the certification day we had an open mike and there are some comments:

1. *I was so excited to come to a university for the first time in my life, thank you!*
2. *I was scared of Statistics, now I know this thing and I will be the one that says “I know it and come forward with confidence..I like this thing, Statistics!”*

Progress and Future plans at UKZN

1992 - 2009: Workshops on one campus, ad hoc
(D. North only, teachers/DOE)

2010: Workshops on 2 campuses, sustainable
(FET/GET whole department involved)

2011: Expand 2010 by doing GET/FET/**Financial
Mathematics & Probability**

2012: Introduce assessment (optional) for UKZN
project

2012 or 2013: Run a 5-day workshop for DOE
subject advisors

Rolling out at other universities

2011: put all details of this program on CD
(review notes!)

2011 Nov: Give a talk at SASA, link Stats SA maths4stats coordinators with university stats departments

2012->: Start rolling out the UKZN maths4stats program at other volunteer universities

FUTURE PLANS: Poster competition for school children with computer prizes for winning schools, sponsored by computer software company

Thank you!

