

# *Setting up a Network of Workshops to Empower In-Service Teachers*

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# Outline

## **Statistics Capacity Building at Grassroots Level in South Africa**

- \* the need
- \* challenges

## **maths4stats program**

- \* overview
- \* progress

## **KZN maths4stats Lecture Series**

- \* legacy program launched by UKZN
- \* progress
- \* future plans

## **Conclusion**

## Statistics Capacity Building at Grassroots Level in South Africa: The Need

**All over the world, increased need for decision -making based on data collection, organization, analysis and interpretation....from making top end business decisions to understanding tables and graphs in the media (basic statistical literacy)**

# Building statistics capacity requires us to increase the flow at each level

School leavers  
with interest  
in making  
Statistics  
their career of  
choice

Under  
graduate  
studies in  
Statistics

Post graduate  
studies in  
Statistics

# Statistics Capacity Building = growing the economy

Demand for Statisticians 

Unemployment in South Africa rife

***OBVIOUS SOLUTION??????***

**Statisticians are very employable graduates  
But this message is not out there yet!**

# Major problem

- Statistics “hidden” in mathematics curriculum, called Data Handling
- **Lack of sufficiently trained Mathematics Teachers** (legacy of Apartheid era) -> Teachers often leave out the Data Handling sections!

# What we want to achieve

- \* 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: Reality

## PROBLEM

Teachers - little/no training  
in Statistics!!

Learners - no clue that  
Data Handling  
leads to a career  
as a Statistician  
(hidden)

## WAY FORWARD

**Fast track** existing training  
initiatives – collaboratively with  
Stats SA and DOE

Design new ways to get  
**message** into the class room –

- \* posters in class rooms
- \* OPEN DAY games
- \* **train teachers**



# Stats SA ISIBALO project: maths4stats

Launched by **Statistics South Africa** in **2007**

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

- 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



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.**

# FAST TRACK maths4stats in KZN

Jan 2014 Paper 3 abolished in RNCS..Probability will now be done by ALL learners in grade 12? Are teachers ready? .

Growing awareness that the maths4stats workshops, run by Stats SA need a major boost to reach **more teachers in shorter time intervals...progress is simply too slow!**

# Putting into perspective

So, we have a problem with the introduction of Statistics at school level (similar all over the world but more severe, but **why should University statistics departments** be concerned about this?

# 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.....

Particularly **PROBABILITY** as teachers of mathematics are trained to be **focused** on the **algebraic processes** rather than the **interpretation of results...focus on formulas, procedures and not interpretation and reflection on results obtained**

# University statistics lecturers

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



# Academic Statisticians at UKZN

- ....found Statistics “by luck”!!!

WSC2009 first time ever on African soil...decided as a group of Statisticians to make a difference by introducing a TRUE legacy to having the world conference in Statistics in Durban!

**Conceptualized KZN maths4stats lecture series**

# KZN 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.

# 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.

## 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*

# 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

## 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		
<b>TITLE, NAME &amp; SURNAME:</b>	IASE/IOS Satellite Conference, Macau, August 2013	
<b>INSTITUTION/SCHOOL NAME AND DISTRICT:</b>		
<b>POSTAL ADDRESS</b>		
<b>TELEPHONE AND CELLPHONE NUMBER:</b>		
<b>FAX NUMBER:</b>		
<b>EMAIL ADDRESS:</b>		
<b>REGISTER FOR FET WORKSHOPS AT UKZN EDGEWOOD CAMPUS (PINETOWN):</b> For 2010		
<b>Date</b>	<b>Topics to be done</b>	<b>Tick ( X ) Lectures to attend</b>
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	
<b>OR REGISTER FOR FET WORKSHOPS AT UKZN PMB CAMPUS:</b>		
<b>Date</b>	<b>Topics to be done</b>	<b>Tick ( X ) Lectures to attend</b>
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	
<b>Completed registration form should be faxed or emailed to the following person:</b> <b>Name:</b> Lusanda Mkwenkweni <b>Fax Number:</b> (031) 305 9939 OR 086 528 6915 <b>Email Address:</b> <a href="mailto:Lusandamk@statssa.gov.za">Lusandamk@statssa.gov.za</a> <b>Enquiries:</b> (031) 3600 600 ext 618 (tel) OR 082 803 9132 (cell)		



## 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)

FET PROBABILITY AND FINANCIAL MATHEMATICS - PMB 2011

No	District	School name	Surname	Name	Gender	Tel	Fax	Cell phone	E-mail
1	Empangeni	Cqongolombi	Ngema	Ph Zanele	F	035 474 8152 034 622 55777	031 305 9939	082 225 4353	
2	Empangeni	Nqundu Combined	Sibiya	Mabusi C.	Female	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	<a href="mailto:khuzwayosho@yahoo.com">khuzwayosho@yahoo.com</a>
5	Othukela	Ngcongosi-Bethany	Dladla	McDonald B.	Male			083 366 7743	
6	Othukela	Thabane Secondary	Hlone	Nokusa Sylvia	Female			078 375 0614	
7	Othukela	Thembela high	Zulu	Hlengiwe A	Female			072 419 8696	
8	Pinetown	Lockhat High School	Mbonambi	Sipho M	M	032 541 0008		083 550 5455	<a href="mailto:0835505455@mtnloaded.co.za">0835505455@mtnloaded.co.za</a>
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	<a href="mailto:Richkofey2003@yahoo.com">Richkofey2003@yahoo.com</a>
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	<a href="mailto:www.rmsos@ovi.com">www.rmsos@ovi.com</a>
16	Sisonke	Mount Currie SSS	De Kock	Erica M	F	073 647 1202	039 727 3662		<a href="mailto:urbandk@telkomsa.net">urbandk@telkomsa.net</a>
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	<a href="mailto:buki@ananzi.co.za">buki@ananzi.co.za</a>
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	<a href="mailto:s.girdhary@webmail.co.za">s.girdhary@webmail.co.za</a>
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	<a href="mailto:myzaph@telkomsa.net">myzaph@telkomsa.net</a>

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# Teachers travel long distances at own cost to attend Saturday classes



# 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.

## UKZN :Repeat lessons on 2 campuses

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

# Program: Certification Day 2010

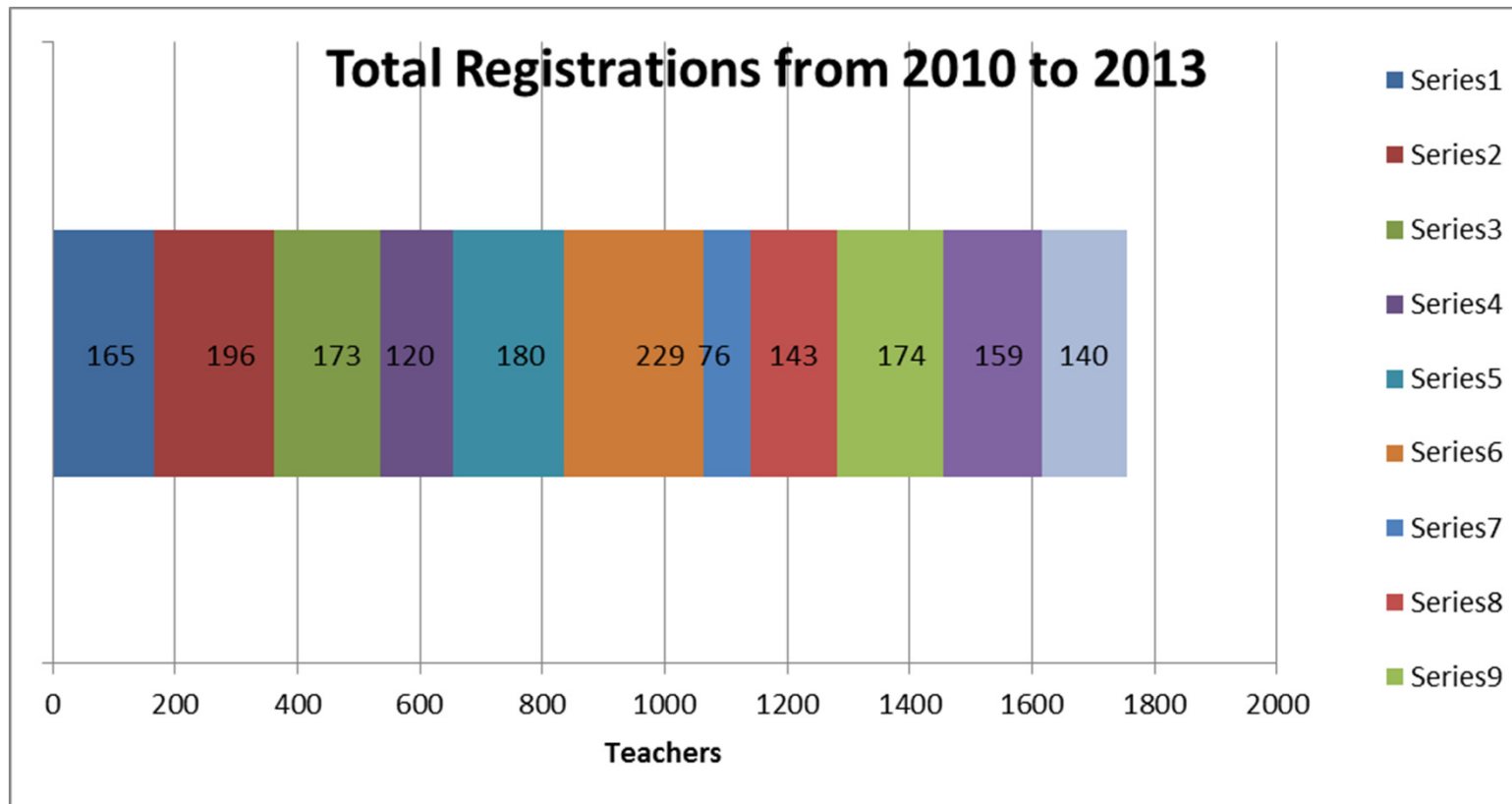
	FET Session	GET Session	
08:30am	Lesson 5	Casio workshop	UKZN and Casio
10:00am		Tea	Stats SA
10:30am	Tea	Lesson 5	Stats SA and UKZN
11:00am	Casio		Casio
12:30pm	Award Ceremony		
	Introductions of Guests		Ms N. Makhatha (Stats SA)
	Background to the Project		Prof. D. North
	Address by SG: Stats SA		Mr. 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

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





## Almost 1 800 teachers have attended the 5-week program at UKZN between 2010 and 2013



# 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: KZN maths4stats lecture Series

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)

2013: Added SAS Curriculum Pathways

# Future Plans

Run a **5-day (consecutive)** workshop for DOE subject advisors and teachers that have got over 60% in the maths4stats assessment

**Day 1 to Day 3:** Classes and tutorials (exercises)

**Day 4:** SAS Curriculum Pathways (Computer lab)

**Day 5:** Assessment followed by a workshop on “making your own Statistics class room materials”.

## CONCLUSION

We **HAVE** to think of **innovative** and new ways to **attract** more students to **study Statistics**, improve **throughput**, reduce **drop-out**, increase **post grad numbers** and **research output** of Statistics at HEI's....and in doing so we will be helping reduce **unemployment** as they **WILL** get **jobs!!!**

At UKZN it is onwards and upwards for spreading the word about ***STATISTICS***