saair

Southern African Association for Institutional Research

Institutional Research Institute 2015

Report Writing and Data Visualization

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Report Writing and Data Visualization

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(SAAIR) Institutional Research Institute - July 2015
Wits University

UNIVERSITY OF THE
WITWATERSRAND
JOHANNESBURG

UNISA | university of south africa

Structure of presentation

❑ Contextualizing report writing

❑ Kinds of reports and examples

❑ Common sense selection of graphs

❑ Examples of data visualization

❑ Writing style

❑ Discussion

Purpose of the Report

❑ What is the report responding to?

❑ Who are the major stakeholders involved (audience)?

❑ What are the suggested intentions behind analysis and recommendations?

❑ Who are the intended beneficiaries of change?

❑ How is implementation of the suggested change to be achieved?

❑ How does one develop ownership of the report amongst the potential users of the work/report produced?

(Taylor, Rizvi, Henry: 1997)

TYPES OF IR REPORTS

POLICY AND PRACTICE

- ❑ Stakeholder research project (language policy study)

- ❑ Needs assessment (profile analysis)

- ❑ Perceptions and experiences (satisfaction surveys)

- ❑ Commissioned research (directly leading to practical adjustments)

- ❑ Reflective studies (those who got away study)

- ❑ Programme assessment (first year experience)

- ❑ Early warning system (student performance reports)

TYPES OF IR REPORTS (Cont…..)

CORPORATE REPORTS

- ❑ Institutional performance reports (annual reports)

- ❑ Portfolio reports (research/ teaching and learning)

- ❑ Project reports (end of project)

- ❑ Facts and figures (bird's eye-view)

- ❑ Reflective studies (impact analysis)

- ❑ Statutory reports (integrated report)
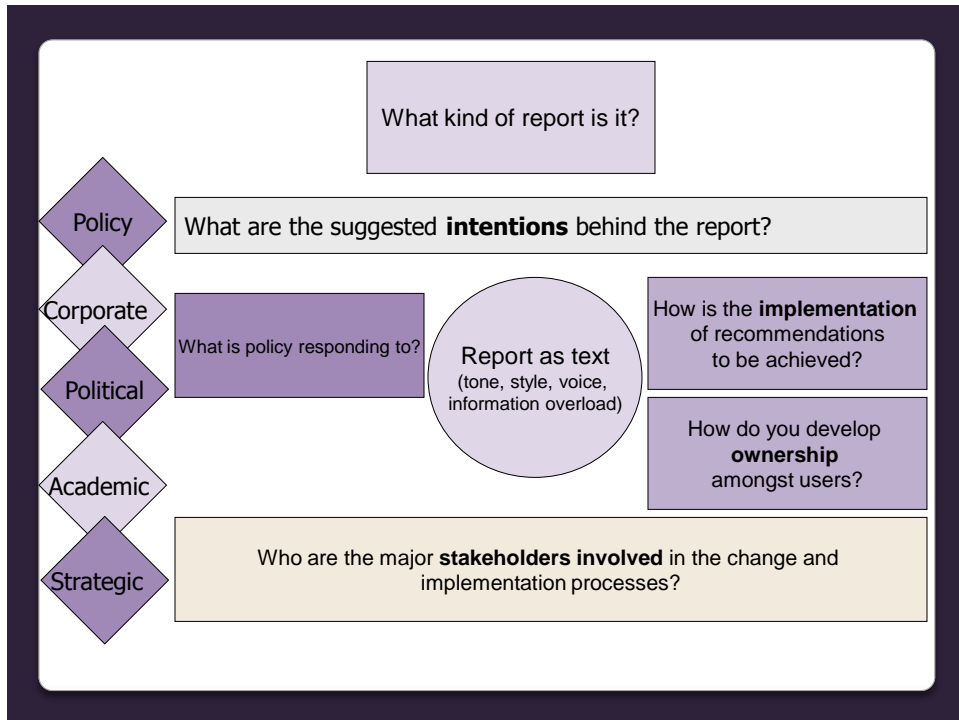
TYPES OF IR REPORTS (Cont…..)

MONITORING & EVALUATION

- ❑ Progress reports
- ❑ Strategy assessment reports
- ❑ Faculty/school profile reports
- ❑ Review reports (departmental review reports)
- ❑Internal trend analysis (cohort studies)
- ❑ Impact assessment reports
- ❑ Evaluation reports (course evaluation; dashboards)

TYPES OF IR REPORTS (Cont…..)

ENVIRONMENTAL SCANNING

- ❑ Benchmarking reports (rankings)
- ❑ Comparative Analysis (state of research report)
- ❑ Market trend analysis (international student mobility report)
- ❑ Clientele profiling (market analysis report)
- ❑ Stakeholder perception (employer surveys; alumni tracer studies)
- ❑ User surveys/studies (graduate exit studies)
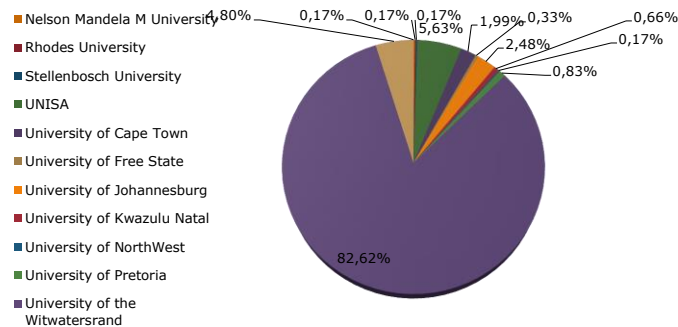- ❑ Efficiency ratios

What kind of report is it?

Policy

What are the suggested **intentions** behind the report?

Corporate

Political

What is policy responding to?

Report as text
(tone, style, voice, information overload)

How is the **implementation** of recommendations to be achieved?

How do you develop **ownership** amongst users?

Academic

Strategic

Who are the major **stakeholders involved** in the change and implementation processes?

INSTITUTIONAL CONSEQUENCES

❏ Assembling evidence against a **particular framework**: (theoretical / ideological/ conceptual / criteria)

❏ Is **rigorous**, **iterative** (team effort /quality assurance)

❏ Is **often resisted** (over-regulation/ increased accountability/ autonomy/ there is nothing new/ offended users)

❏ Will lead to **changed discourses** → practices/ resources/ strategies

❏ Is a continuing process: developing a **culture** / **ethos** of assuring and promoting evidence based practice and decision making

Graphs and visualization of data

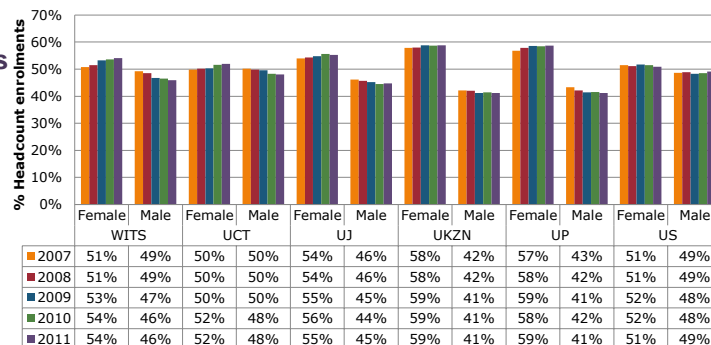*Preferred university for further studies - 2008 Wits graduates*

Pie chart

- ■ Nelson Mandela M University
- ■ Rhodes University
- ■ Stellenbosch University
- ■ UNISA
- ■ University of Cape Town
- ■ University of Free State
- ■ University of Johannesburg
- ■ University of Kwazulu Natal
- ■ University of NorthWest
- ■ University of Pretoria
- ■ University of the Witwatersrand

4,80% 0,17% 0,17% 0,17% 5,63% 1,99% 0,33% 0,66% 2,48% 0,17% 0,83% 82,62%

❑ Showing how total amount is divided into separate parts

❑ All parts will add to 100%

❑ Cannot use in showing trends, benchmarks, relationships between variables, or multiple variables

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Graphs and visualization of data

Bar graphs

% Headcount enrolments

|	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male
	WITS		UCT		UJ		UKZN		UP		US	
2007	51%	49%	50%	50%	54%	46%	58%	42%	57%	43%	51%	49%
2008	51%	49%	50%	50%	54%	46%	58%	42%	58%	42%	51%	49%
2009	53%	47%	50%	50%	55%	45%	59%	41%	59%	41%	52%	48%
2010	54%	46%	52%	48%	56%	44%	59%	41%	58%	42%	52%	48%
2011	54%	46%	52%	48%	55%	45%	59%	41%	59%	41%	51%	49%

❑ Use if values on the horizontal axis are distinct

❑ Often start at zero and scale should be correct

❑ Values should be consistent

Graphs and visualization of data

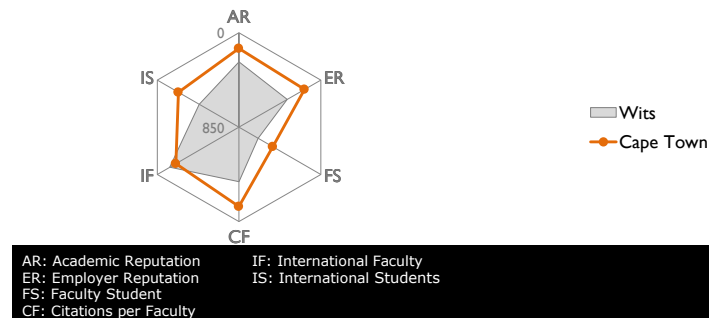*PhD Graduate output by University – The top Five (2005 – 2011)*

Line graphs
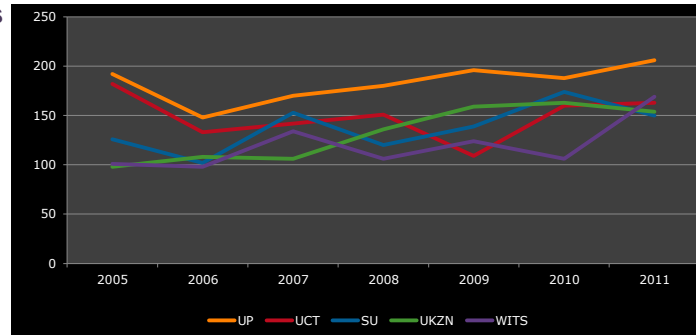
❑ Use if values on the horizontal axis are continuous

❑ Does not need to start at zero

❑ Very good if comparison is the purpose of analysis

Graphs and visualization of data

QS Rankings comparison between UCT and Wits - 2014

Spider-web graphs

AR: Academic Reputation   IF: International Faculty
ER: Employer Reputation   IS: International Students
FS: Faculty Student
CF: Citations per Faculty

❑ Trend analysis and multiple variables

❑ Very good if comparison is the purpose of analysis

❑ Provide data legends

Strategies to improve reports

- ❑ Summarize key findings in words and numbers
- ❑ Be judicious about including tables and graphs in the body of the report
- ❑ Use words to describe the meaning of a statistical analysis
- ❑ Recognize that statistical significance may have no practical importance
- ❑ Ask your audience for suggestions about improving reports

More strategies

- ❑ Distribute key findings in one-page briefs or web pages, and refer to the full report
- ❑ Use bullets
- ❑ Use a question and answer format
- ❑ Put technical material and tables in a separate document
- ❑ Use different formats for different audiences
- ❑ Include anecdotes or quotes to support findings

Table example

Perm Temp	Personnel Category	2001	2002	2003	2004	2005	2006
Permanent	Crafts & Trades	17	19	14	13	13	18
Permanent	Executive/Administration/Management Professional	93	101	99	122	125	120
Permanent	Instructional/Research Professional	1292	1369	1403	1391	1448	1583
Permanent	Non-professional Administration	1113	1121	1255	1227	1140	1129
Permanent	Service	588	540	478	466	441	450
Permanent	Specialist/Support Professional	163	200	227	235	224	282
Permanent	Technical	427	424	691	779	712	702
Temporary	Crafts & Trades	4	3	14	12	5	1
Temporary	Executive/Administration/Management Professional	13	37	14	10	8	5
Temporary	Instructional/Research Professional	2601	3260	3532	2870	2997	2979
Temporary	Non-professional Administration	2310	2143	2240	2086	1498	2243
Temporary	Service	78	74	71	61	51	65
Temporary	Specialist/Support Professional	1447	1711	1749	213	305	125
Temporary	Technical	1228	1732	1851	2331	1661	1227
TOTAL		**11374**	**12734**	**13638**	**11816**	**10628**	**10929**

Table example

Institution	Faculty	Current Fees	Max Fee	Weighted Fee
Cape Technikon	Applied Science	11,751,890.00	11,986,820.00	11,378,128.40
	Built Environenment & Design	15,359,120.00	15,467,640.00	7,955,000.17
	Business Informatics	33,457,030.00	58,057,580.00	34,982,529.15
	Education	19,774,580.00	23,151,620.00	20,567,288.71
	Engineering	17,865,550.00	20,540,680.00	17,670,991.88
	Management	51,946,770.00	65,446,470.00	53,616,074.22
	Sub-Total	**150,154,940.00**	**194,650,810.00**	**146,170,012.53**
Peninsula Technikon	Business Studies	12,142,250.00	14,273,580.00	11,972,752.70
	Engineering	19,065,910.00	26,791,750.00	21,968,352.62
	Science	13,806,805.00	16,622,690.00	13,948,268.16
	Sub-Total	**45,014,965.00**	**57,688,020.00**	**47,889,373.48**
	TOTAL	**195,169,905.00**	**252,338,830.00**	**194,059,386.01**
	DIFFERENCE RE. CURRENT FEES		**57,168,925.00** **29.3%**	**-1,110,518.99** **-0.6%**

Table example

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Table example

Appendix A: Intake, Graduate, Exclusion & Drop-out Analysis - CONTACT

Cohort of 2000	Intake	Graduated [1]		Excluded						Exited						Continuing		Graduated [2]	
Qual Level	Total	Total		Readmitted Another Qual		Not Readmitted		Total		Changed Qual		Dropped Out		Total		Total		Total	
Doctors by coursework	21	12	57.1%	0	0%	0	0%	0	0%	0	0%	7	33.3%	7	33.3%	2	9.5%	12	57.1%
Doctors by thesis	175	90	51.4%	0	0%	1	0.6%	1	0.6%	13	7.4%	56	32%	69	39.4%	15	8.6%	91	52%
Honours	1009	867	85.9%	0	0%	2	0.2%	2	0.2%	26	2.6%	113	11.2%	139	13.8%	1	0.1%	885	87.7%
Masters by coursework	1038	548	52.8%	2	0.2%	5	0.5%	7	0.7%	51	4.9%	400	38.5%	451	43.4%	32	3.1%	571	55%
Masters by thesis	365	172	47.1%	1	0.3%	1	0.3%	2	0.5%	51	14%	133	36.4%	184	50.4%	7	1.9%	205	56.2%
Postgraduate bachelors	210	73	34.8%	0	0%	0	0%	0	0%	95	45.2%	42	20%	137	65.2%	0	0%	150	71.4%
Postgraduate diplomas	865	622	71.9%	0	0%	3	0.3%	3	0.3%	74	8.6%	166	19.2%	240	27.7%	0	0%	664	76.8%
TOTAL	3683	2384	64.7%	3	0.1%	12	0.3%	15	0.4%	310	8.4%	917	24.9%	1227	33.3%	57	1.5%	2578	70%

Question …

Provide the data for 2008, 2009 and 2010 on the number of students attending exams per college.

Pivot table example

Student Count Attending Examinations

①

Student Count	Year			
College	**2008**	**2009**	**2010**	**Grand Total**
COLLEGE OF AGRICULTURE AND ENVIRONMENTAL SCIENCES	962	743	48	1753
COLLEGE OF ECONOMIC AND MANAGEMENT SCIENCES	3793	2680	160	6633
COLLEGE OF HUMAN SCIENCES	3323	2882	286	6491
COLLEGE OF LAW	917	722	69	1708
COLLEGE OF SCIENCE, ENGINEERING AND TECHNOLOGY	1200	1185	131	2516
Grand Total	**10195**	**8212**	**694**	**19101**

②

Cluster bar chart

CPUT 2005 Enrolments, by Group
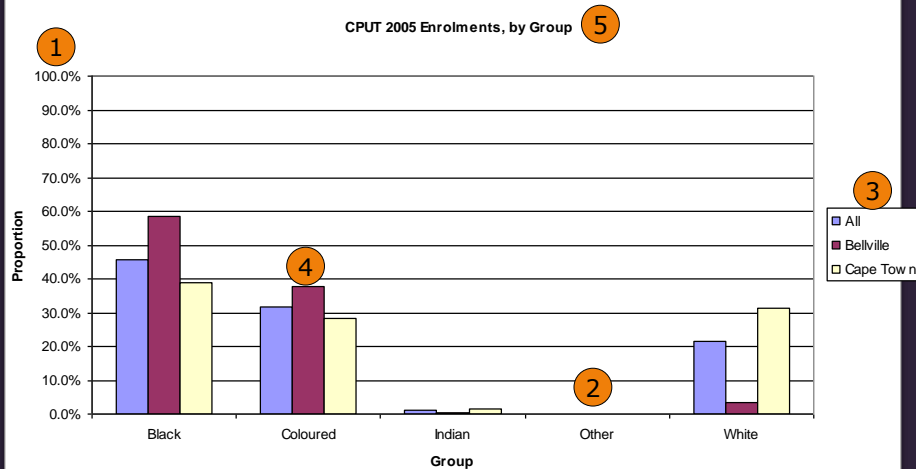
Figure 7a: Average Time to Complete Postgraduate Qualifications

Science & Agriculture — UKZN
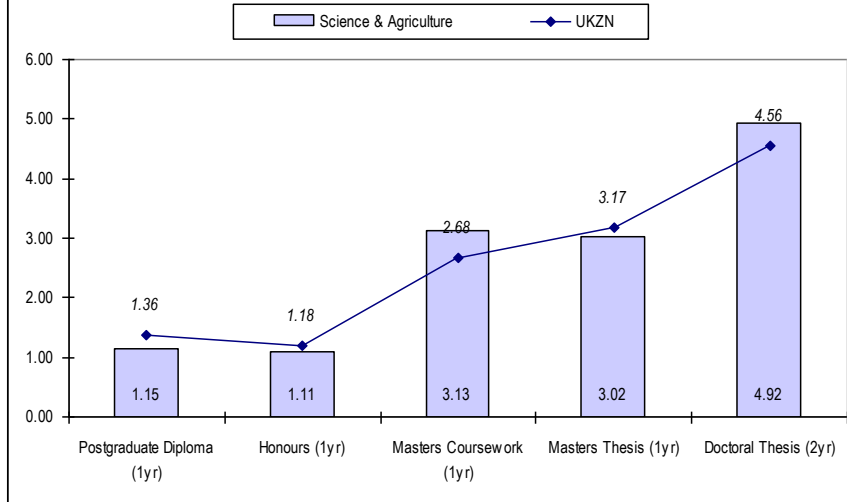
Cohort Completion Rate (Contact, PG)
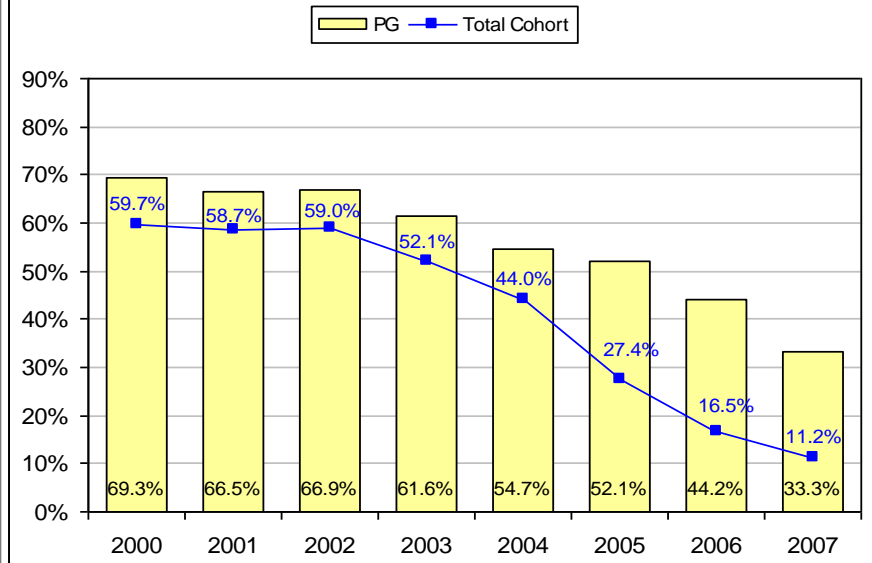
Selection, Acceptance, Registration and Intake rates

University module Passrate

Horizontal Bar Chart

Graduation Rate of Technikons: 2000

Source: 'Education Statistics in SA at a Glance in 2000'
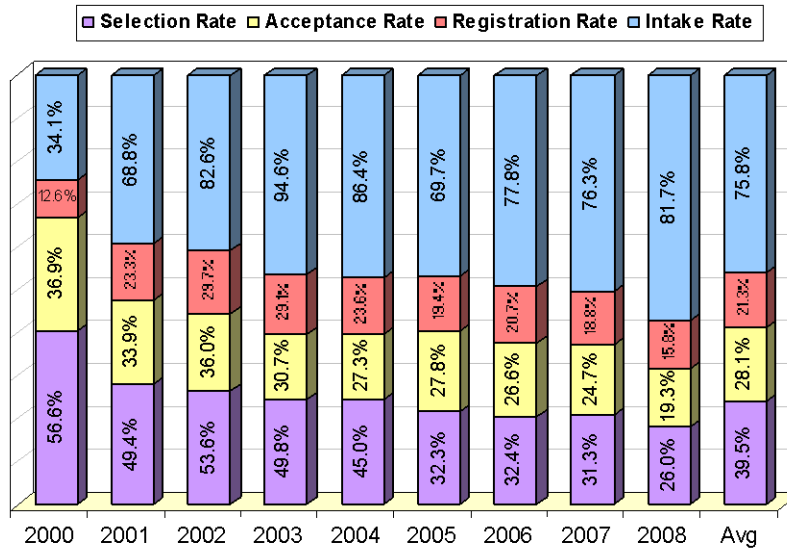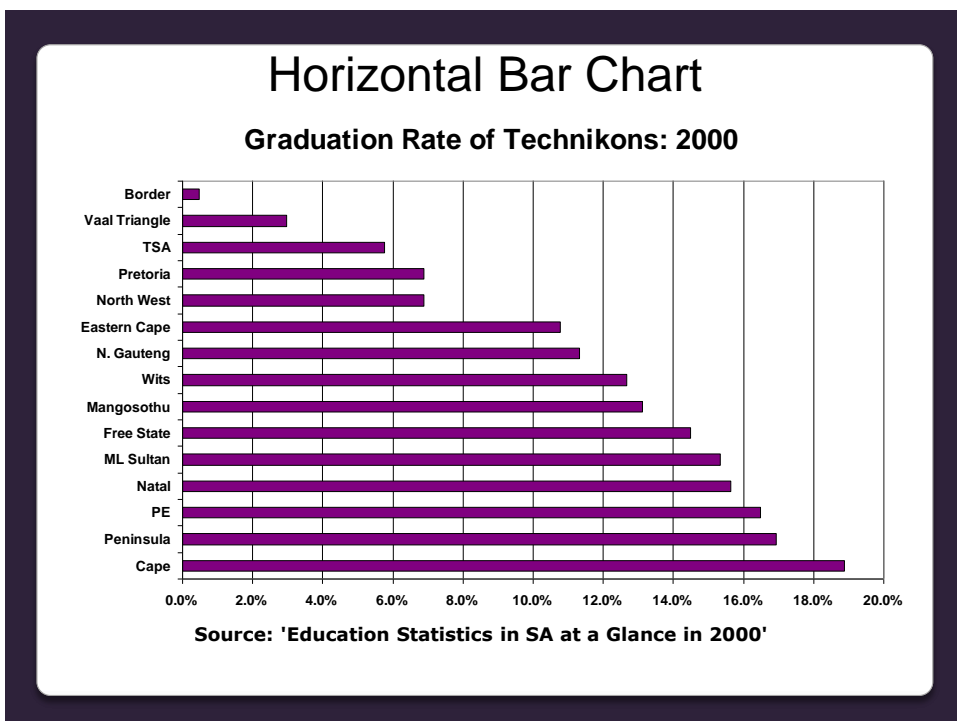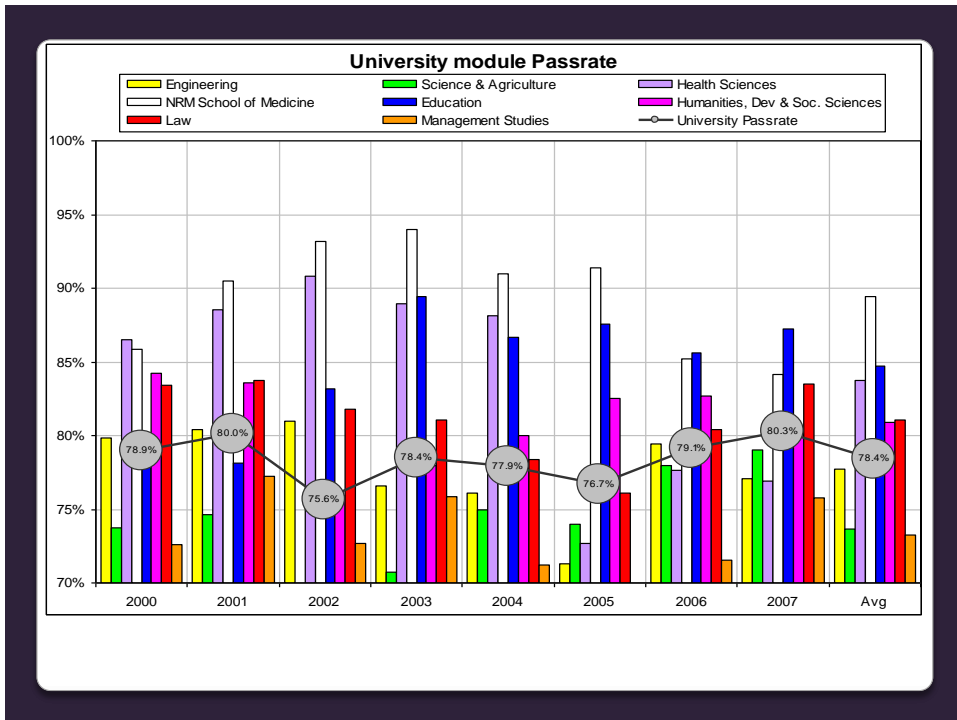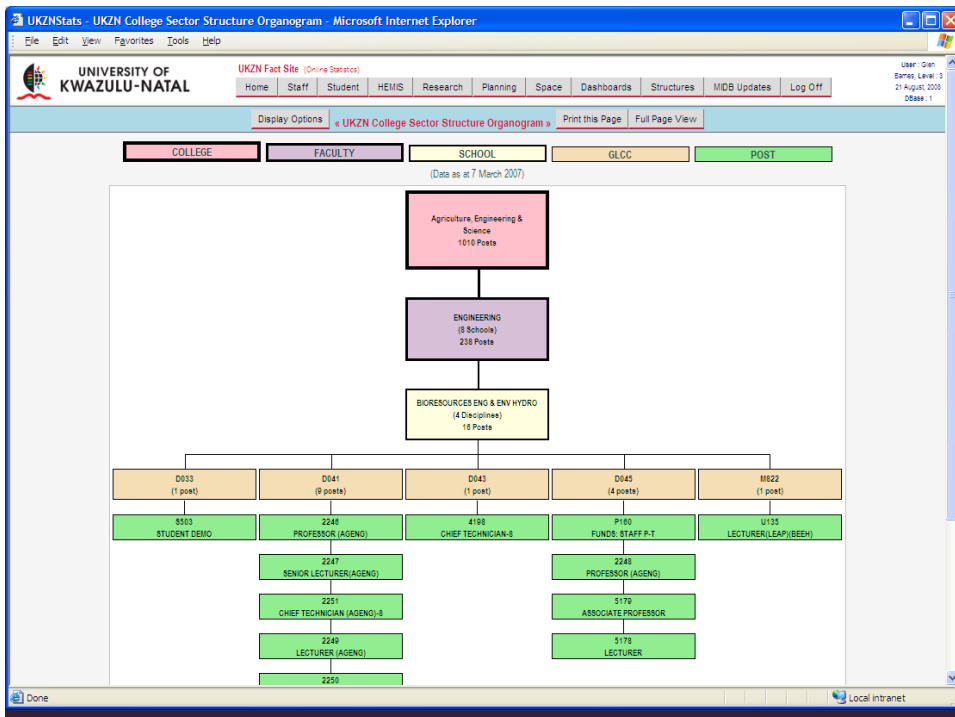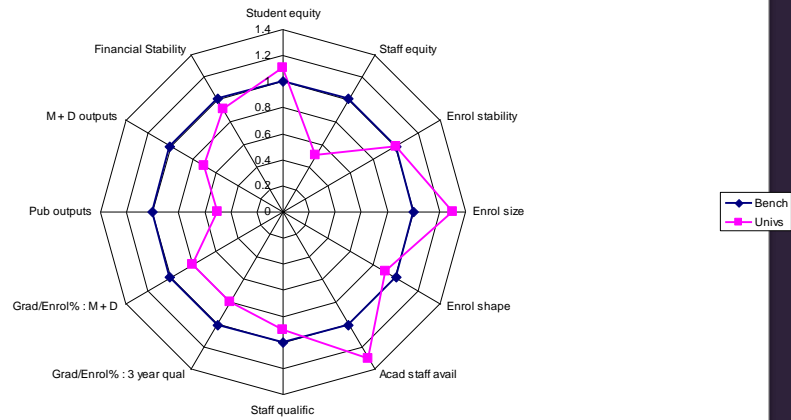
International System of Units (SI)

❑ The modern form of the **metric system**.

❑ Generally a system of units of measurement.

❑ The world's most widely used system of measurement, both in everyday commerce and in science;

Only Burma, Liberia & the USA have NOT adopted the system.

• Consider the importance for institutional researchers …

SI writing style

❑ Use space as thousands separator (*1 000 000*) in contrast to commas or periods (*1,000,000* or *1.000.000*) in order to reduce confusion resulting from the variation between these forms in different countries. In print, the space used for this purpose is typically narrower than that between words (commonly a *thin space*).

❑ South Africa have adopted the standard of a space as thousands separator.

SI writing style

- ❑ The 10th resolution of CGPM in 2003 declared that "the symbol for the decimal marker shall be either the point on the line or the comma on the line." In practice, the decimal point is used in English-speaking countries as well as most of Asia and the comma in most continental European languages.

- ❑ South Africa has adopted the decimal comma, except in the case of financial figures where the decimal point is used in line with the World Bank standard in this regard.

Questions and discussion