# From the Trenches – Using Learning Analytics (& other things)

## A Story

## by

## Roz Havenga

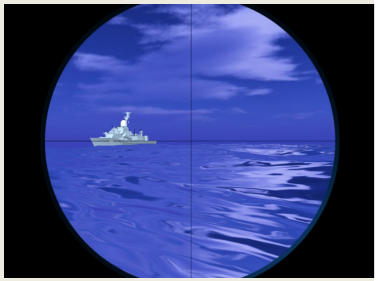
saair
Southern African Association for Institutional Research
CONFERENCE 2014

DUT DURBAN UNIVERSITY OF TECHNOLOGY

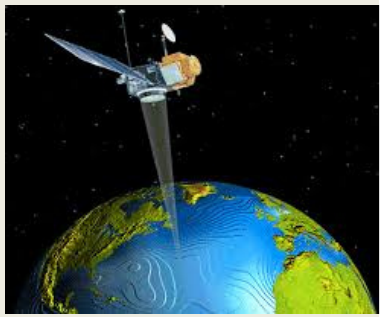
# SAAIR -Yesterday, Today and Tomorrow (Past, Present and Future)

- Chapter 1: The Past – Microscopic Focus
  - Prior to July 2010.

- Chapter 2: The Present – Periscopic View
  - July 2010 to September 2014



- Chapter 3: The Future – Satellite Scan
  - 1 October 2014 …



# Bunkers or Trenches?

# CHAPTER 1 - THE PAST – Prior to JULY 2010 – Microscopic Focus

# Background

- Own department - Locus of Control
- Autonomous (Isolation??)
- Focus was on the micro environment
- Driven by personal/team TLA philosophy
- Identify & optimise strengths & weaknesses
- **Rudimentary LA (even before it was defined)**
- Development of computer & spreadsheet skills
- Degrees of magnification
  - Programme
  - Subject
  - Assessment (Clow 2012; Ellis 2013)

# Programme Level Monitoring

| # | Student no | Surname | First Name | Subject 1 | Subject 2 | Subject 3 | Subject 4 | |
|---|---|---|---|---|---|---|---|---|
| | | | | 30% | 30% | 20% | 20% | |
| 0 | Control | | | 100 | 100 | 100 | 100 | |
| 1 | | | | 72 | 75 | 75 | 74 | 74 |
| 2 | | | | 69 | 65 | 47 | 64 | 62 |
| 3 | | | | 64 | 61 | 70 | 78 | 67 |
| 4 | | | | 81 | 85 | 94 | 73 | 83 |
| 5 | | | | 63 | 58 | 70 | 85 | 67 |
| 6 | | | | 69 | 69 | 76 | 77 | 72 |
| 7 | | | | 52 | 40 | 51 | 46 | 47 |
| 8 | | | | 60 | 56 | 79 | 53 | 61 |
| 9 | | | | 65 | 58 | 71 | 66 | 64 |
| 10 | | | | 61 | 58 | 60 | 65 | 60 |
| ++ | | | | | | | | |
| | | | High | 81 | 85 | 94 | 85 | |
| | | | Low | 33 | 20 | 23 | 28 | |
| | | | Average | 60 | 61 | 72 | 59 | 63 |
| | | | # Registered | 29 | 28 | 32 | 34 | |
| | | | # Distinctions | 1 | 2 | 4 | 3 | |
| | | | Pass Rate | 83% | 79% | 94% | 74% | |
| | | | # Fail | 5 | 6 | 2 | 9 | |
| | | | Attendance | 83 | 86 | 80 | 79 | 82 |

# Subject Level Monitoring

| | Student# | Student Name | Calling name | Group # | C/work | Final Test Mrk | Ass 1 | Ass 2.1-WrBP | Ass 2.2 BMC | Ass2.3 Oral | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WEIGHTING | | | | | 10% | 30% | 20% | 10% | 10% | 20% | Attend | 100% | |
| CONTROL | | | | | 100 | 100 | 100 | 100 | 100 | 100 | | 100 | |
| 1 | | | | 1 | 82 | 63 | 51 | 72 | 60 | 64 | 90% | 63 | |
| 2 | | | | 5 | 13 | 92 | 39 | 54 | 60 | 58 | 100% | 60 | |
| 3 | | | | 5 | 56 | 50 | 39 | 54 | 60 | 58 | 100% | 51 | Borderline |
| 4 | | | | 5 | 62 | 55 | 39 | 54 | 60 | 58 | 90% | 54 | |
| 5 | | | | 6 | 35 | 58 | 38 | 35 | 60 | 52 | 80% | 49 | Borderline |
| 6 | | | | 1 | 65 | 42 | 51 | 72 | 60 | 64 | 100% | 55 | |
| 7 | | | | 5 | 63 | 83 | 39 | 54 | 60 | 58 | 100% | 62 | |
| 8 | | | | 6 | 62 | 62 | 47 | 40 | 60 | 52 | 60% | 55 | |
| 9 | | | | 6 | 54 | 63 | 47 | 40 | 60 | 52 | 80% | 54 | |
| 10 | | | | 3 | 52 | 41 | 48 | 84 | 60 | 77 | 70% | 57 | |
| 11 | | | | 4 | 61 | 74 | 63 | 100 | 80 | 73 | 100% | 73 | Query distinction? |
| 12 | | | | 6 | 49 | 59 | 47 | 40 | 60 | 52 | 70% | 52 | |
| 13 | | | | 4 | 80 | 100 | 63 | 100 | 80 | 73 | 60% | 83 | Distinction |
| 14 | | | | 7 | 35 | 31 | 0 | 19 | 50 | 49 | 70% | 29 | Fail |
| | | | | | | | | | | | | | |
| Average | | | | | 55 | 62 | 44 | 58 | 62 | 60 | 85 | 57 | |

# Assessment Level Monitoring

| | Student# | Student Name | Calling name | Pg1 | Pg2 | Total | Pg3 | Pg4.1 | Total | Pg4.2 | Pg5 | Total | Pg6 | Pg6 | Pg6 | Pg7 | Pg8 | Total | Total | % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | General | | | Marketing | | | Finance | | | T/F | | | Extra Q | | | | | |
| | | CONTROL | | 15 | 15 | 30 | 15 | 10 | 25 | 10 | 25 | 35 | 30 | Wrong | 30 | 15 | 5 | 20 | 140 | 100 |
| 1 | | | | 10.5 | 14 | 24.5 | 15 | 9 | 24 | 8 | 24 | 32 | 22 | 7 | 20 | 14 | 8 | 22 | 122.5 | 88% |
| 2 | | | | 11 | 15 | 26 | 13 | 9.5 | 22.5 | 3.5 | 20 | 23.5 | 19 | 11 | 13 | 12 | 1 | 13 | 98 | 70% |
| 3 | | | | 5 | 15 | 20 | 14 | 8 | 22 | 4 | 11 | 15 | 26 | 4 | 27 | 6 | 0 | 6 | 90 | 64% |
| 4 | | | | 12.5 | 13 | 25.5 | 13 | 1.5 | 14.5 | 3 | 14.5 | 17.5 | 20 | 10 | 15 | 3 | 0 | 3 | 75.5 | 54% |
| 5 | | | | 7.5 | 12 | 19.5 | 16 | 2.5 | 18.5 | 2 | 9.5 | 11.5 | 20 | 10 | 15 | 11 | 0 | 11 | 75.5 | 54% |
| 6 | | | | 8.5 | 4.5 | 13 | 6.5 | 1.5 | 8 | 4 | 29 | 33 | 22 | 8 | 19 | 5 | 0 | 5 | 78 | 56% |
| 7 | | | | 5.5 | 20 | 25.5 | 9.5 | 8 | 17.5 | 6 | 7.5 | 13.5 | 19 | 11 | 13 | 8 | 0 | 8 | 77.5 | 55% |
| 8 | | | | 2.5 | 9 | 11.5 | 13 | 9 | 22 | 1.5 | 17 | 18.5 | 16 | 10 | 11 | 7 | 0 | 7 | 70 | 50% |
| 9 | | | | 7 | 12 | 19 | 1.5 | 0 | 1.5 | 2.5 | 0 | 2.5 | 27 | 3 | 29 | 3 | 1 | 4 | 56 | 40% |
| 10 | | | | 6 | 9 | 15 | 13.5 | 1.5 | 15 | 0 | 9.5 | 9.5 | 18 | 12 | 11 | 4 | 1 | 5 | 55.5 | 40% |
| | | | | | | | | | | | | | | | | | | | | |
| | | | Average | 8 | 12 | 20 | 12 | 5 | 17 | 3 | 14 | 18 | 21 | 9 | 17 | 7 | 1 | 8 | 80 | 57% |
| | | | % | 51% | 82% | 67% | 77% | 51% | 66% | 35% | 57% | 50% | 70% | | 58% | 49% | 22% | 42% | 57% | |

# Assessor Rating

## - Calibration, Staff and Student Development

| | | | | Group# | Pres Assessor 1 | Pres Assessor 2 | Pres Assessor 3 | Pres Assessor 4 | Presentation |
|---|---|---|---|---|---|---|---|---|---|
| | | CONTROL | | | | | | | 100 |
| 1 | | | | 3 | 76 | 70 | 78 | 77 | 75 |
| 2 | | | | 4 | 73 | 68 | 73 | 75 | 72 |
| 3 | | | | 1 | 64 | 60 | 68 | 61 | 63 |
| 4 | | | | 2 | 64 | 55 | 68 | 61 | 62 |
| 5 | | | | 5 | 53 | 52 | 66 | 51 | 56 |
| 6 | | | | 6 | 50 | 49 | 59 | 50 | 52 |
| 7 | | | | 7 | 47 | 45 | 52 | 51 | 49 |
| | | | Average | | 61 | 57 | 66 | 61 | 61 |

# Our Principles

- Integrated spreadsheets
- Year-on-year comparisons.
- Cohort control – admittance, reregistration, grad
- Discussion between staff - teamwork.
- Data captured as close to event as possible.
- Real-Time information and action.

# Challenges

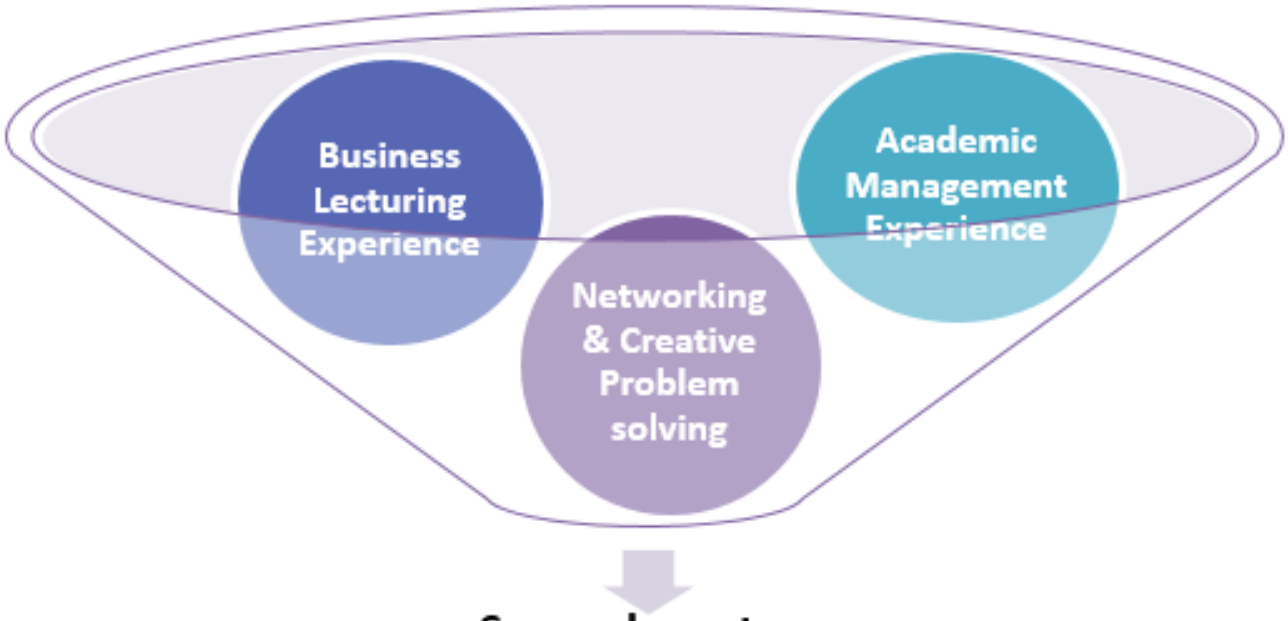
- Accuracy dependent on the skill of the user – Error rate higher.
- Spreadsheet skills relatively uncommon.
- Frustration with an “off the grid” spreadsheet system and the lack of integration.
- Visual representation of data on graphs is labour intensive.
- Data re-entry from spreadsheet to ITS – inefficient task duplication.
- Adoption of learning analytics is based in educational theory - teaching and learning paradigms would also have to be shared.
- Collection, analysis & action relating to the data is time consuming
- Recording & reporting suffered – lost of highly beneficial findings.

# Benefits

- **For Students:**
  - Early warning of at-risk or top performance
  - Feeling valued - one-on-one interviews
  - Could project performance required (What-if analysis)
  - Given “career guidance” with evidence
  - Lay counselling and Student Counselling referrals (sub-unit of programme!)

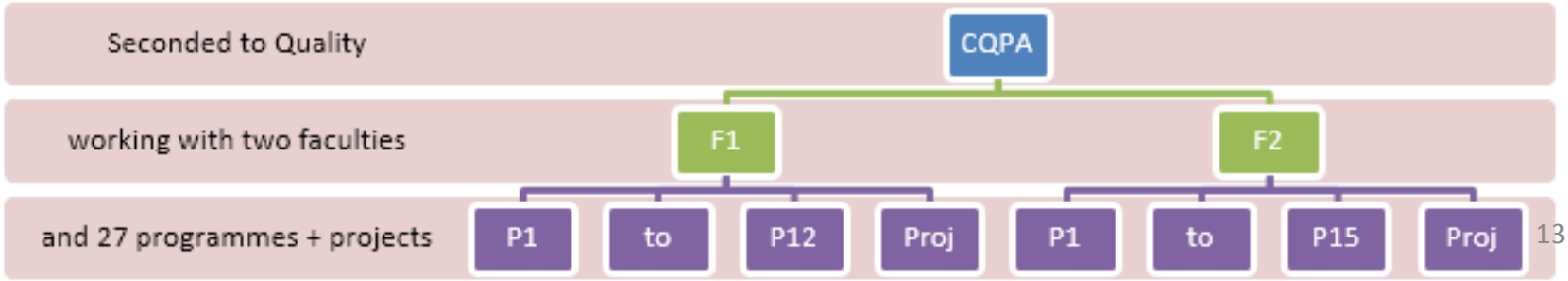
- **For us:**
  - reallocation of resources such as:
    - best lecturer for the task,
    - assessment refinement,
    - assessor rating skills verification and development.
  - Curriculum management – syllabi, time allocations, timing
  - Tracking an individual student from entrance test to graduation.
  - Optimised registration packages – timetable management

# Transition 1 - Mid 2010




**Secondment as**

**Quality Promotion Officer**

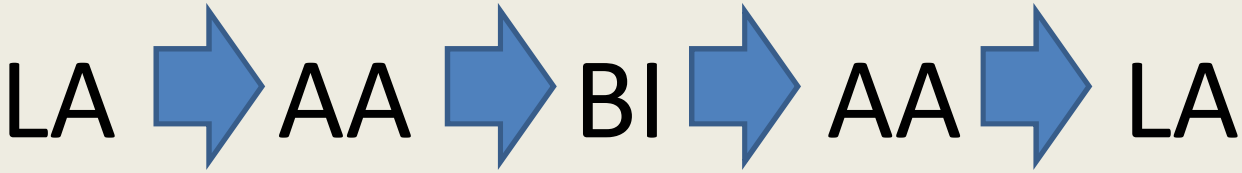


# CHAPTER 2 - THE PRESENT – JULY 2010 to SEPTEMBER 2014 – Periscopic View

# Significant Events / Observations

- Change in the profile of the QPO
- New Institutional Quality Policy -> new Annual Quality Monitoring Requirement
- Performance data neither used significantly nor fully understood by programme managers.
- No locus of Control – Adopted “Encouragement”
- Ambits with diverse approaches – shared good practice

- Focus on the market environment
- Driven by Management & Administrative Principles
- Implementation of Performance Indicators (now Academic Analytics)




**Business Intelligence**

**Academic Analytics**

**Learning Analytics**

# Principles

- Needed a framework and a plan
- Driver - Strategy vs Operations
- Each programme as a “Small Business”
- Effective and efficient
- Need for standardised systems and structure
  - Not rigid
  - Not compulsory
  - Optimised use of critical resources (time & skill)

# Step 1 - “Find and File”.

- Systematic approach to departmental organisation.
- Locate Performance indicators within appropriate area of departmental management
  - Master plans - Strategy, Quality, Programme Management,
  - Management functions - Marketing, Staffing, Finance, and Infrastructure
  - Academic areas - Teaching, Research
- Alignment of the Annual Performance Report and the departmental filing system guidelines
- Major housekeeping exercise in each department – usually only appreciated after the event
- A picture emerges!

# Step 2 - “What’s it all about?”.

- identifying and defining the relevant performance indicators;
- understanding the formulae/correct application;
- the use of appropriate external, institutional and faculty-specific benchmarks;
- knowing the source of the data (ITS, MI, QA, CAO, HR);
- Understanding relevant timelines

Two overriding factors – funding and quality

# Performance Data (1)

## The Big 5

- Enrolment Plan - First time and Other registrations – actual versus planned.
- Headcount - Gender / Race
- Throughput and Dropout Rates
- Graduation Rates
- Programme and Faculty Success rates
  - Individual subject pass rates
  - most challenging indicator to monitor at lecturer level.
  - DHET benchmark = 80% success rate
  - Implementation of Learning Analytics!

# Performance Data (2)

Marketing -

- CAO applications, shortlisted students and actual registrations
- Matric pass (Degree vs Diploma entrance

Research

- Postgraduate headcount, throughput, graduation rates, equity, outputs.

Staffing

- Staff numbers, qualifications, equity, turnover, development, and succession planning.

Finance

- Departmental annual income and expenditure
- Headcount : FTE ratios

Quality

- Subject and Lecturer evaluation analysis, graduation survey data including employment rates and continuing education.

# Step 3 - “How do we…?” (1)

- Analyse AA results and identify possible contributing factors that will require further analysis – becoming drivers for LA.
- Success dependent on:
  - the depth of understanding gained in step two
  - sound technology & analytical skills
  - academic & managerial experience (Trenches and Bunkers)
  - interest and aptitude.
- Faculty wide discussion - committees, forums and workshops common understanding and innovative ideas on student attendance, assessment, teaching and learning practice.
- Communication in formal & regular departmental committees
  - staff meetings
  - staff-student meetings and
  - advisory board meetings

# Step 3 - “How do we…?” Observations

- Programmes are distributed randomly across all three of the above stages.
- Time Management – Urgent vs Important!
- Timelines
- Understanding difference between ITS & MI.
- Averaging of data masks critical information.
  - eg pass rates in a department with two undergraduate programmes.
- Mutual trust and respect.

# Step 4 - “We can do it!”

Final (interim??) goal

- Full use of defined benchmarks, drawn at appropriate times, and feeding in to management of subject, programme, department and faculty, is the norm.
- All staff able to use performance indicators (LA & AA) to strategically drive improvement in their ambits.
- Bottom-up approach leading to institutional improvement, happier and more productive staff and students.

No department is fully at this stage yet – due mainly to the lack of time/tools to implement all three previous stages.

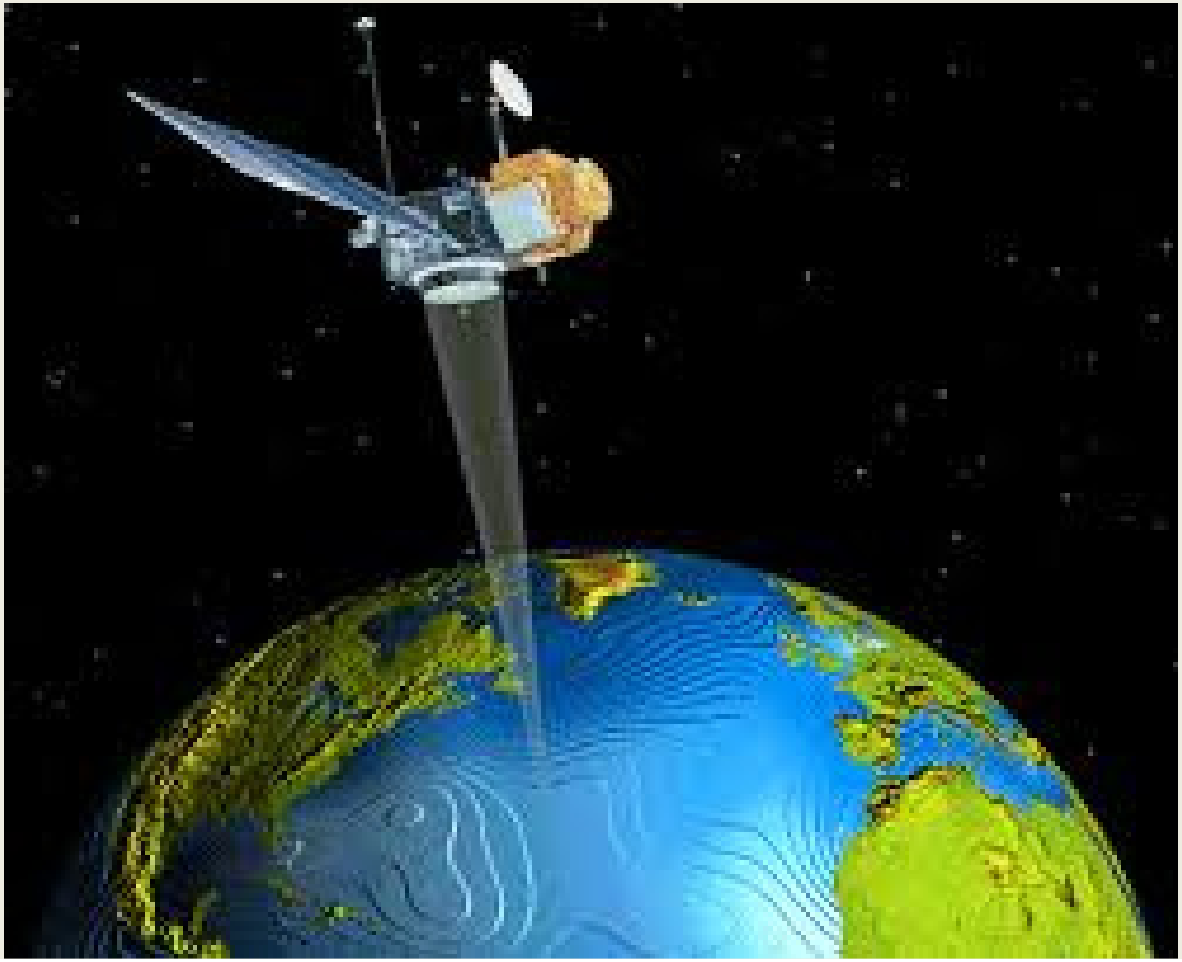
# Observations

- Long way to go
- Two major challenges – Finance & Expertise
- Currently in a Report Intensive Era
- Evidence based vs Record of Practice
- Cannot manage what we cannot measure
- Cannot improve if we don’t know where we are (need base-line)
- Need to understand what & why before we can determine how & who.
- Work with what we’ve got!

# Transition 2 - Imminent

**Multiple Random Experiences result in a Single Focused Application (with a side serving or two)**

# CHAPTER 3 THE FUTURE – SATELLITE SCAN – OCTOBER 2014 ->…??



# Crystal Ball Gazing (1)

- Personally (Zoomed satellite)
  - Implementation of experience in a single programme
  - "Does the theory work in practice?" – a case study to see if it can be done.
  - Adoption of a structured approach to mining data on learning and programme factors
  - Interim mining of Learning Data using spreadsheets, ITS, Turnitin, BlackBoard.

  + Some side orders – BI & LA

  Maybe by SAAIR 2015 I can report on "Can the practice work in theory"

# Crystal Ball Gazing (2)

- At institution level (Mid level satellite)
  - moving towards incorporation of Learning Analytics into current practice.
  - Features in new strategic plan,
  - discussions have begun about software tools, and budget & other resources required.
  - SAHELA inspired

- The Dream
  - An institutionally driven, electronic, multiply integrated dashboard with visually displayed information
  - Improved Uptake, Speed and Accuracy .

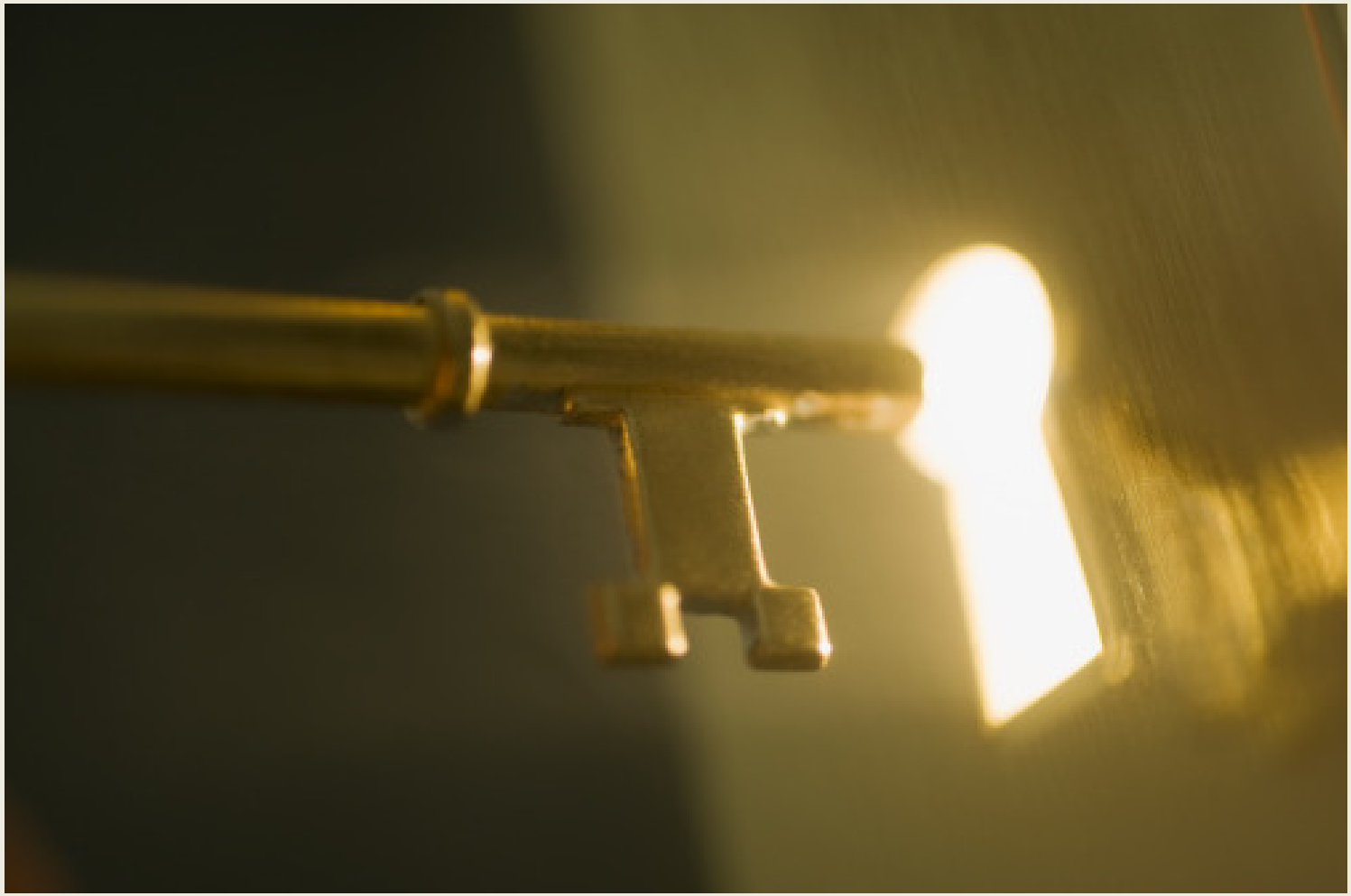
# Crystal Ball Gazing (3)

- National & international level (High level satellite)
  - Linked Data opportunities
  - Learn from early adopters experiences
  - Understand and interact with the role players (LAK, LASI, SAHELA etc)
  - Knowledge of various tools and features

# Final Observations

- Acquisition of any tools is dependent on institutional budget and strategic priorities - out of the parameters of a programme or faculty initiative.
- The best tool will be of little value if the underlying principles are not understood, and if findings are not implemented.
- Need to consider ethics and POPI.
- “Just do it” (Nike & Table 1)

# We have the key – will use it



# Happy 21st Birthday SAAIR!

# Thank you for your attention

rozh@dut.ac.za