USING SYSTEMS THINKING TO DESIGN AN INSTITUTIONAL STUDENT SUCCESS FRAMEWORK

Diane Grayson
Senior Director: Academic Affairs
University of the Witwatersrand

“Student success does not arise by chance. Nor does improvement in institutional rates of student success. When you look at institutions, or indeed programmes within institutions, that are successful in graduating their students you will find they share one common characteristics, namely, that they do not leave student success to chance. Their success is not a random occurrence. It is the result of an intentional, structured course of action that is systematic and coordinated in nature, involving many people across campus.” (Tinto, V. (2014). Tinto’s South Africa lectures. *Journal of Student Affairs in Africa*, 2 (2), 5-28)

WHAT IS STUDENT SUCCESS?

MACRO

Graduates who have the identified attributes of an institution's graduates

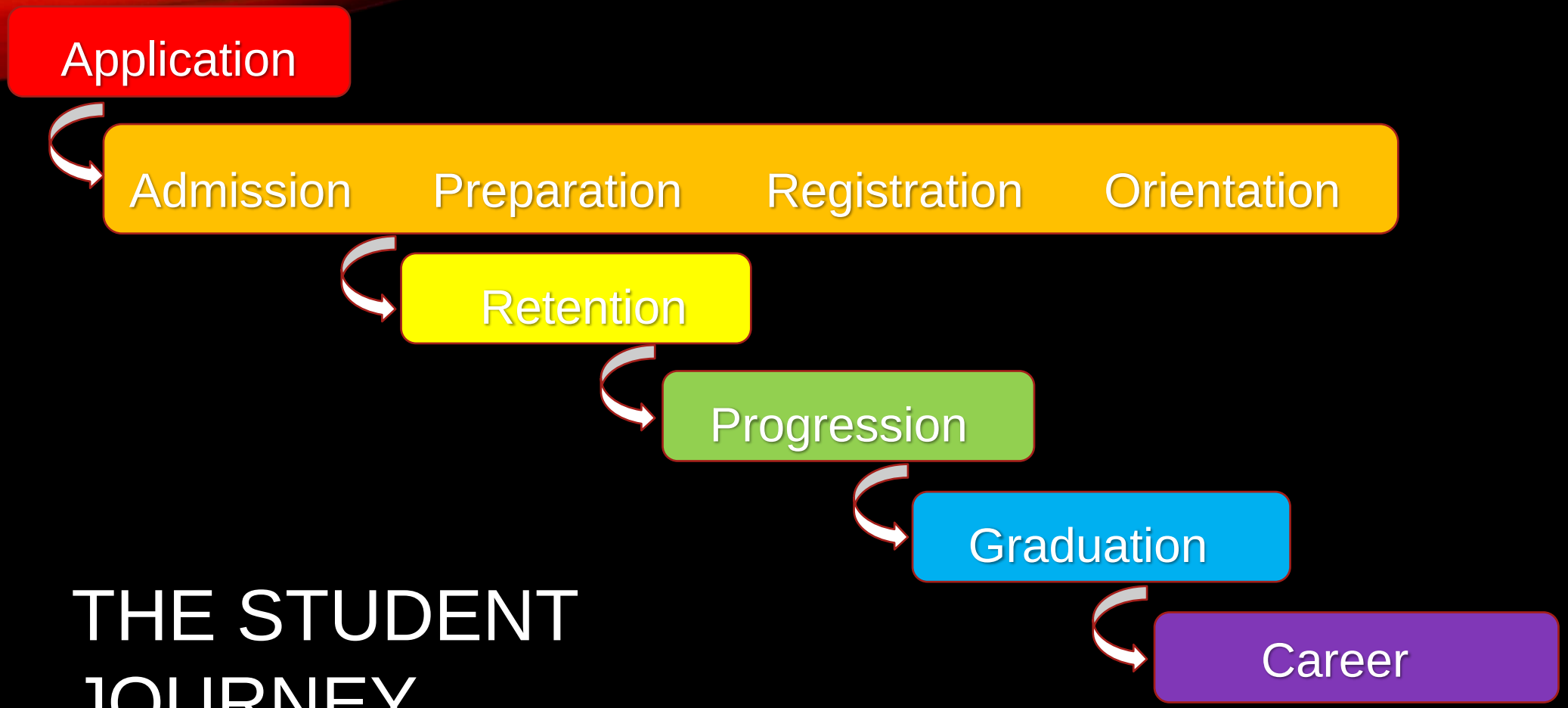
MESO

Indicators of progress towards the goal (above)

MICRO

Individual steps along the way

THE STUDENT JOURNEY



MAIN RESOURCES

- Understanding systems

Donella Meadows, “Thinking in Systems”

- Designing a system

Bela Banathy, “Designing Social Systems in a Changing World”

- Implementing systemic change

Peter Stroh, “Systems Thinking for Social Change”

WHAT IS A SYSTEM?

"A system is an interconnected set of elements that is coherently organized in a way that achieves something." [Donella Meadows (2008). Thinking in Systems.]

- Purpose or function
- Elements
- Interconnections

Systems work perfectly to achieve their purpose. Some systems are not intentionally designed. For example, a system that has as its (unstated) purpose to employ as many people as possible will do just that. This is different from a system intentionally designed to enable as many students as possible to succeed.

SYSTEMS THINKING

"People who are raised in the industrial world and who get enthused about systems thinking are likely to make a terrible mistake. They are likely to assume that here, in systems analysis, in interconnection and complication, in the power of the computer, here at last, is the key to prediction and control. This mistake is likely because the mindset of the industrial world assumes that there is a key to prediction and control." [Systems expert, Donella Meadows. http://donellameadows.org/archives/dancing-with-systems/

“…self-organizing, nonlinear, feedback systems are inherently unpredictable. They are not controllable...The goal of foreseeing the future exactly and preparing for it perfectly is unrealizable.

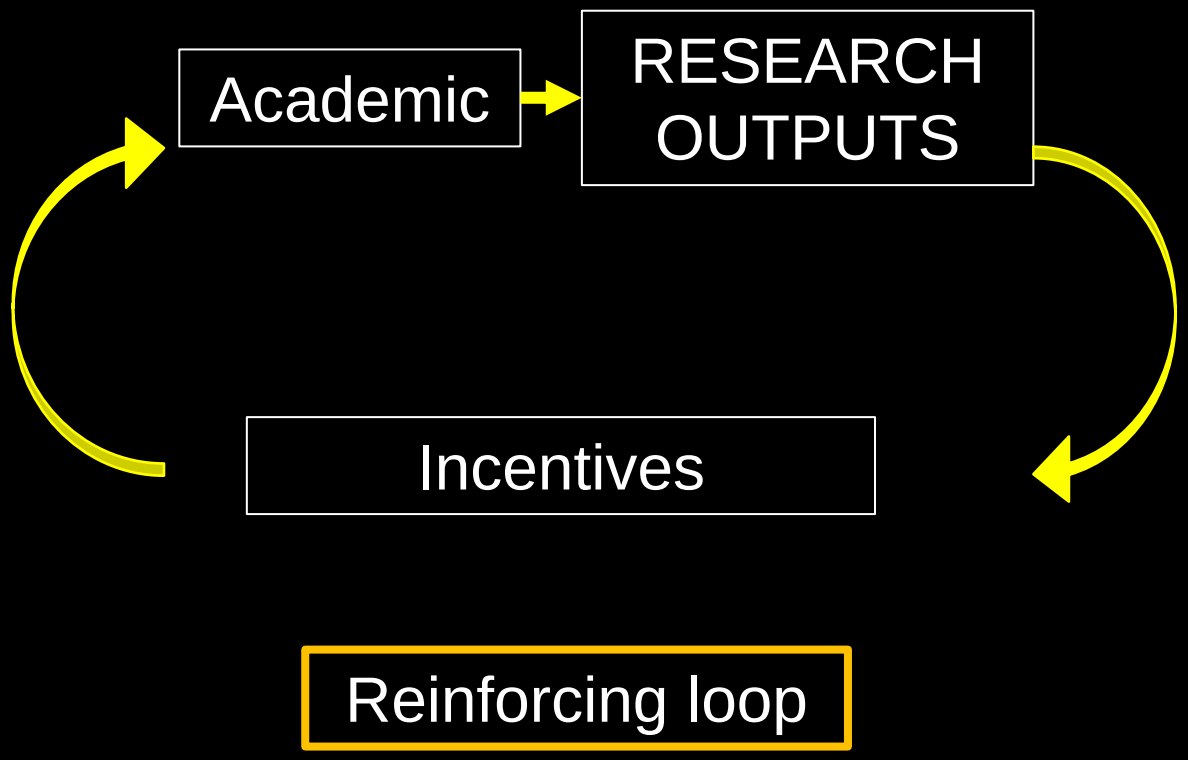
…The future can’t be predicted, but it can be envisioned and brought lovingly into being. Systems can’t be controlled, but they can be designed and redesigned. We can’t surge forward with certainty into a world of no surprises, but we can expect surprises and learn from them and even profit from them. We can’t impose our will upon a system. We can listen to what the system tells us, and discover how its properties and our values can work together to bring forth something much better than could ever be produced by our will alone.

…Living successfully in a world of systems requires more of us than our ability to calculate. It requires our full humanity – our rationality, our ability to sort out truth from falsehood, our intuition, our vision, and our morality.”

System tools

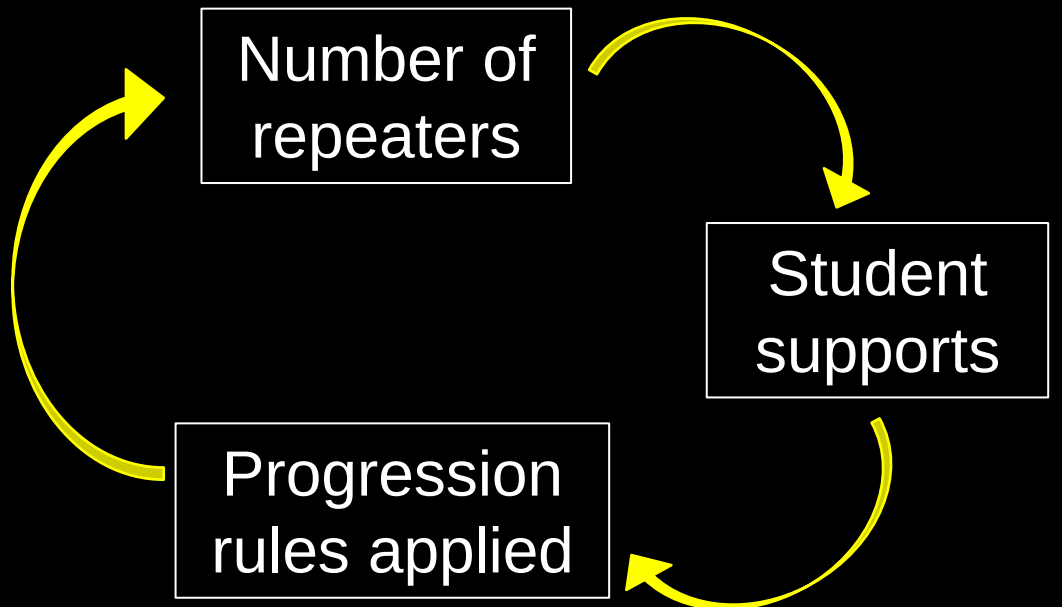
Feedback loops

Increase research output



Reinforcing loop

Reduce unfunded student numbers (students not completing in specified time)



Balancing loop

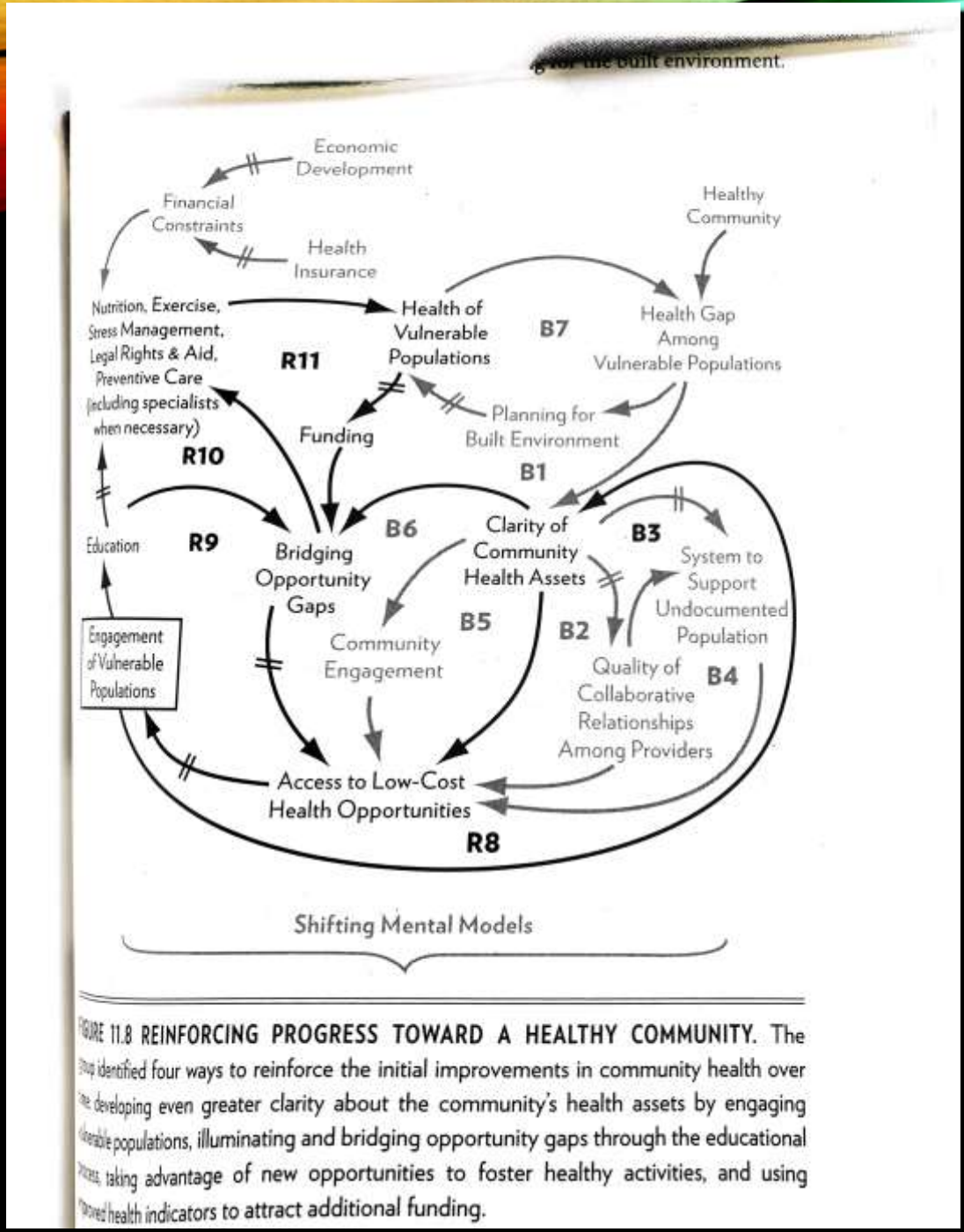


FIGURE 11.8 REINFORCING PROGRESS TOWARD A HEALTHY COMMUNITY. The group identified four ways to reinforce the initial improvements in community health over time: developing even greater clarity about the community's health assets by engaging vulnerable populations, illuminating and bridging opportunity gaps through the educational process, taking advantage of new opportunities to foster healthy activities, and using improved health indicators to attract additional funding.

Systems dynamics diagram

Stroh, DP (2015). Systems Thinking for Social Change, Vermont, USA: Chelsea Green Publishing (p179)

Iceberg tool

High completion rates

High course pass rate, low completion

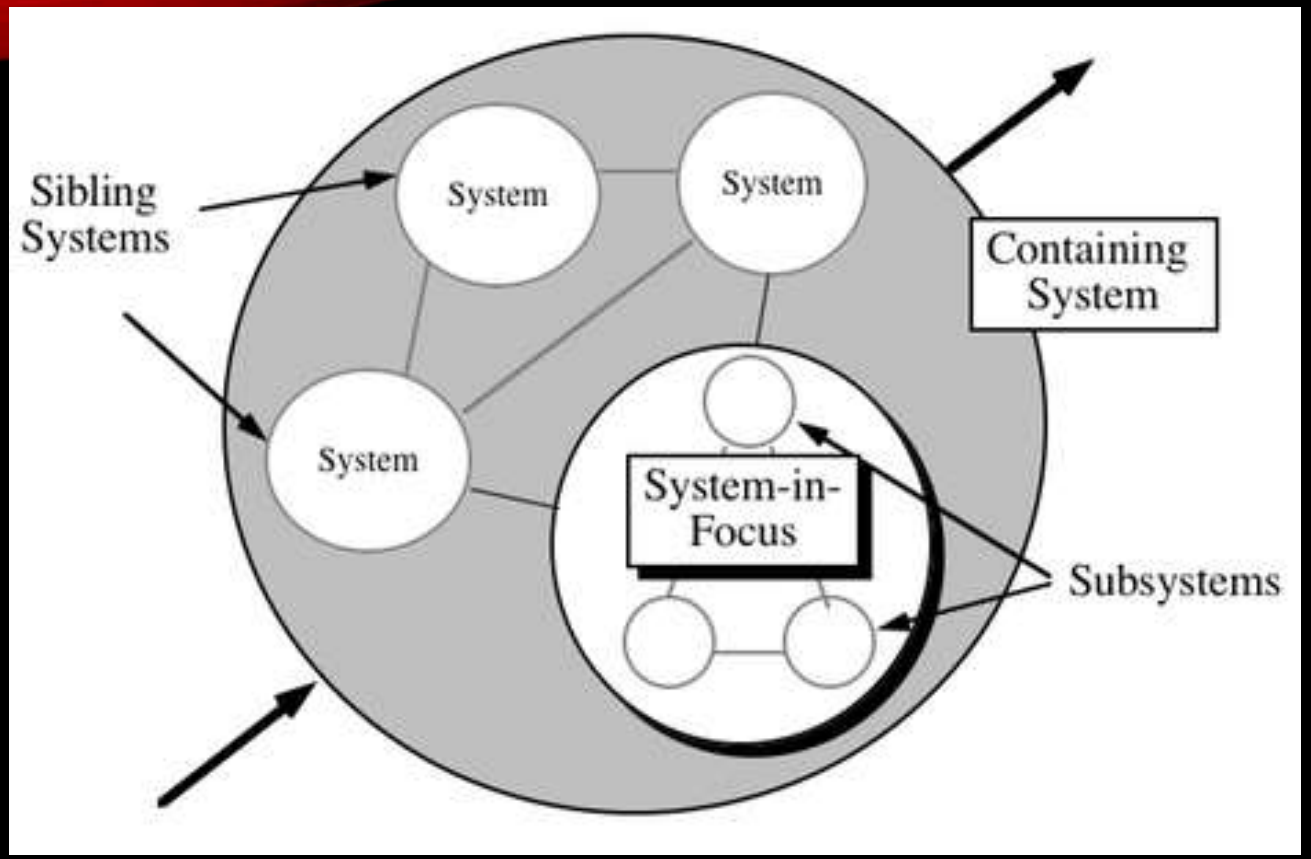
EVENT

High failure numbers or rates in key courses

TRENDS AND PATTERNS

Student factors, lecturer factors, course/programme design factors

SYSTEMS STRUCTURE



The “poached egg” model – sibling systems make up a system of systems

Outside our system of interest:

- The formal academic program
- Physical facilities and resources

DESIGNING A SYSTEM

“In an age, when the speed, intensity, and complexity of change and transformations increase constantly and exponentially, the ability to shape change--rather than becoming its victims or its spectators—depends on our competence and willingness to guide the purposeful evolution of our systems, our communities, and our society. “ Bela Banathy (https://www.whitestag.org/history/founders/banathy_vitae.htm)

SYSTEMATIC APPROACHES VERSUS SYSTEMS DESIGN

Systematic thinking involves following steps in a linear, logical process.

Systems "…design is a creative, disciplined, and decision-oriented inquiry, carried out in iterative cycles…We constantly integrate information, knowledge, insights gained, and the findings of testing into emerging design solutions. This process is not linear, sequential or systematic. Design manifests dynamic interactions between feedback and feedforward, reflection and creation, and divergence and convergence." (Bela Banathy, "Designing Systems in a Changing World")

A "design problem is formulated in view of the solution. And as the solution changes – as it is elaborated – so does the understanding of the problem…it is a mistake to begin design by focusing on the problem and leave thinking about the solution to later stages."

[Design Thinking is different from systems design. It is a specific methodology, comprising five phases—Empathize, Define, Ideate, Prototype and Test]

- “In sharp contrast with the traditional social planning approach, the systems design approach seeks to understand a problem situation as a system of interconnected, interdependent, and interacting issues and to create a design as a system of interconnected, interdependent, interacting and internally consistent solution ideas. Systems designers envision the entity to be designed as a whole, as one that is designed from the synthesis of the interaction of its parts. A systems view suggests that the essential quality of a part of a system resides in its relationship with, and contribution to, the whole… All parts need to be designed interactively, therefore simultaneously.” (Banathy)

DESIGNING A SYSTEM (BANATHY)

1. Purpose

What is the purpose of the system?

2. Functions

What are the specific functions that have to be carried out in order to attain the purpose? How can we organise those functions into a system of functions? (use verbs)

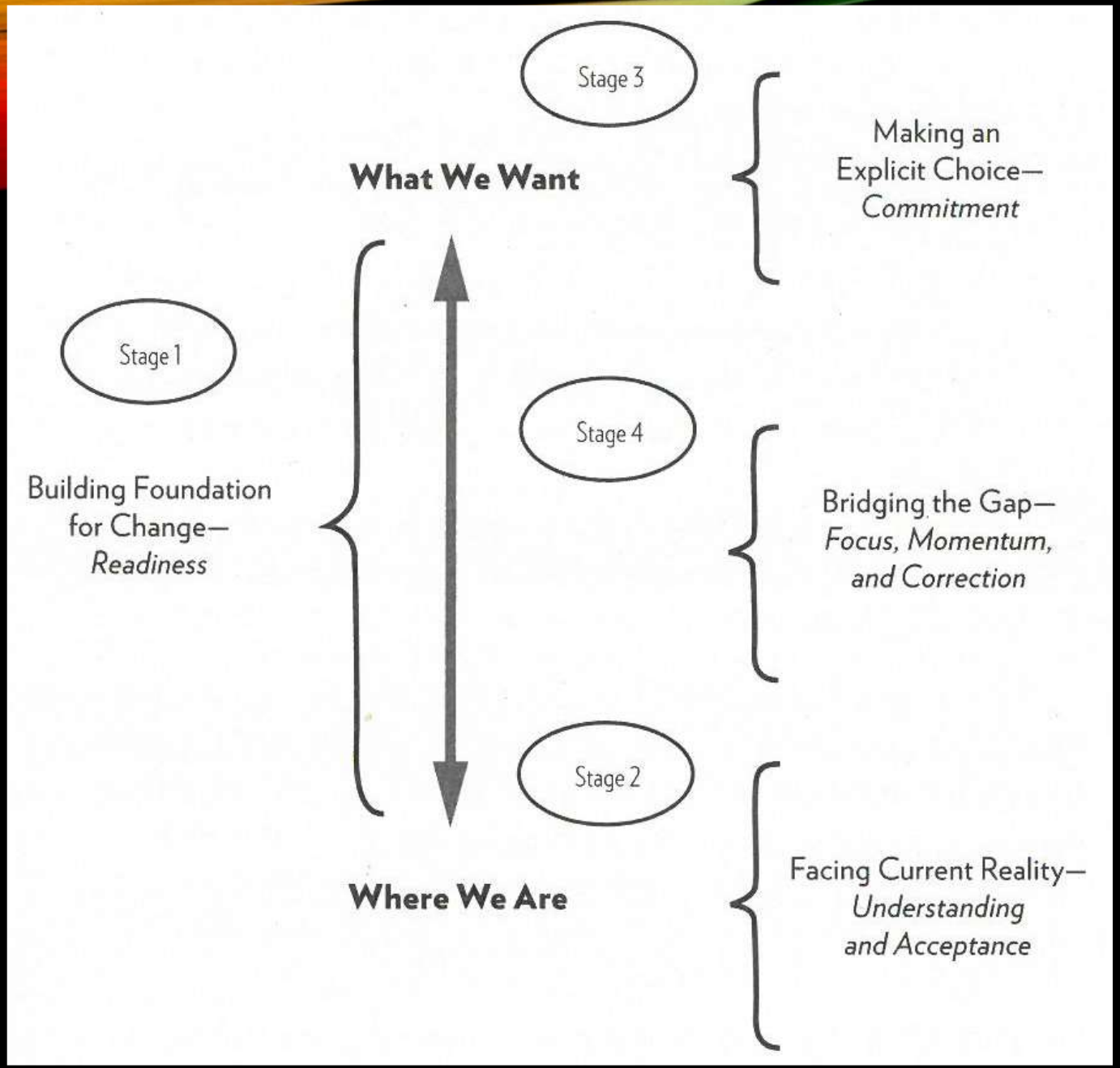
3. Systemic environment

What larger system enables the accomplishment of these functions? How can the support of this larger system be obtained?

4. Constructing a model of the system

Three useful models are (i) systems-environment, (ii) functions/structure, (iii) process-behavioural

IMPLEMENTING SYSTEMIC CHANGE



Four Stages of Leading Systemic Change

From “Systems Thinking for Social Change” by David Peter Stroh (2015).

STAGE 1: BUILDING THE FOUNDATION FOR CHANGE

Engage key stakeholders, develop shared understanding of what we want to achieve, build capacity for collaboration

DVC, Deans, Assistant Deans: Teaching and Learning, Student advisors, Analytics and Institutional Research Office, Student Affairs, Student Enrolment Centre, University and Faculty Registrars, Business Intelligence Services, ICT, Human Resources, Centre for Learning, Teaching and Development, Student Academic Support, Student leaders, Students, Quality and Academic Planning Office

Aided by Wits systems engineers

Cultivate the understanding that we need to change the institution, not "fix" the students. But need to promote student agency and responsibility for their success.

TASK TEAM TO DEVELOP INSTITUTIONAL FRAMEWORK FOR STUDENT SUCCESS

Dean:
Student Affairs

5 Assistant Deans:
Teaching and Learning

Student leader

Head:
Business Intelligence Services

Senior Director:
Academic Affairs

Head:
Student Academic Development

Head:
Institutional Research

Director:
Learning,&
Teaching Center

STAGE 2: FACE CURRENT REALITY

1. Baseline survey widely distributed in October and November 2018; 42 responses received.

- Tutorial based programmes (6)
- Mentorship programmes (6)
- Food security programmes (2)
- Health and wellness (4)
- Academic writing programmes (5)
- Student success coordinators (7)
- Employability (3)
- Other (9)

Variously coordinated at School, Faculty and central levels.

2. Workshop for people involved in advising students (March 2019)

Attended by 46 people from:

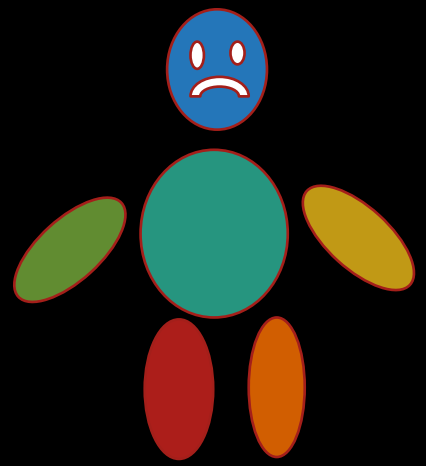
- Student Enrolment Centre
- Student Affairs (CCDU, Campus Health, WCCO, DLU)
- Faculties (advisers, registrars, Academic Development Units)
- ICT
- Fees Office
- Financial and Scholarships Office
- International Student Office
- Institutional Research
- Business Intelligence Services
- Postgraduate Students' Association (PGA)

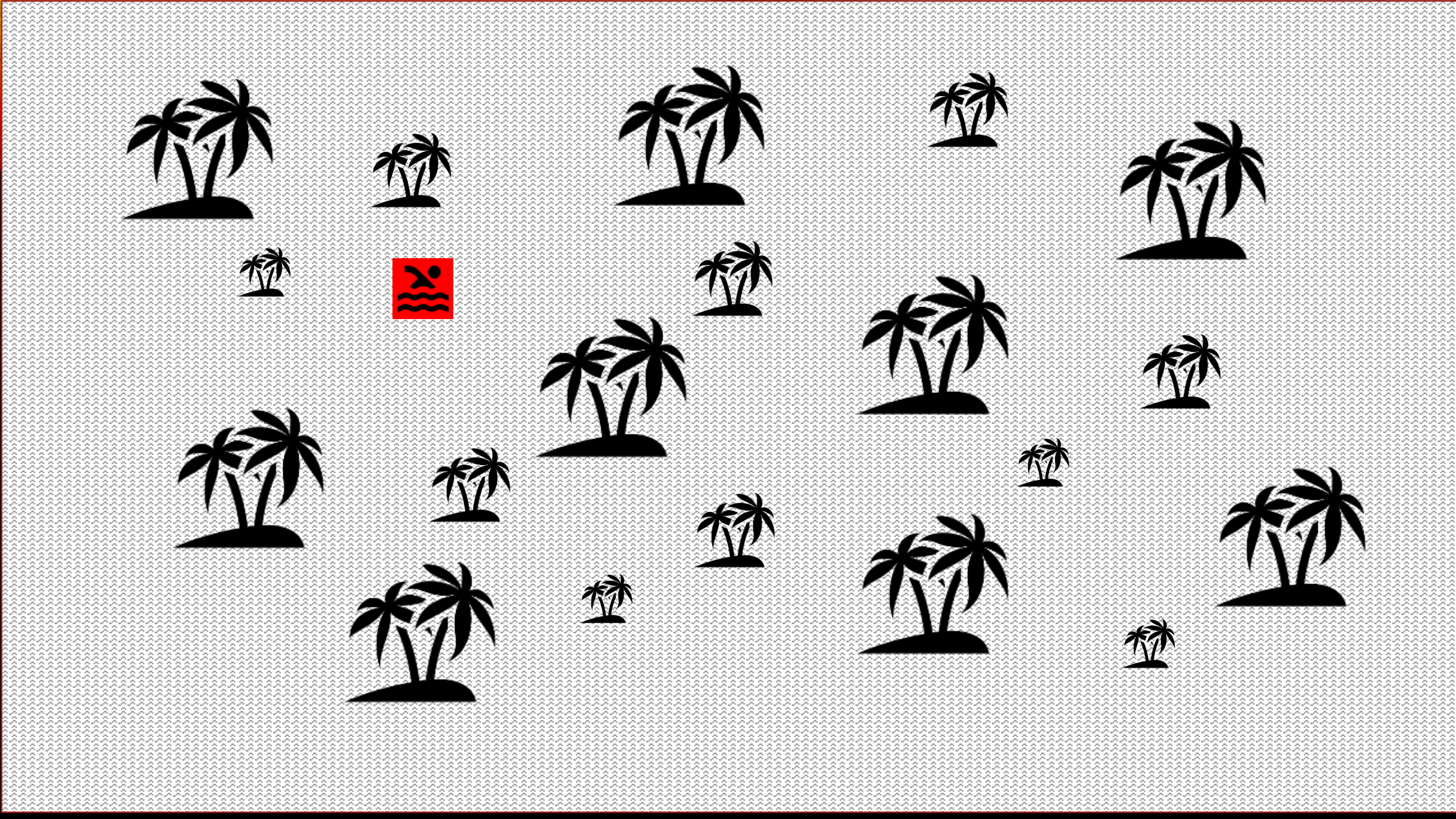
Fragmentation of support

- Registrar
- CFO
- COO
- Dean of Students
- DVC Academic
- Faculty Deans

Unintended consequences (exacerbated by fragmentation)

Example: Students who fail one subject in some programmes have to repeat a year to redo that subject, may lose funding.





STAGE 3: MAKE AN EXPLICIT CHOICE

COMMIT TO WHAT WE WANT

Academic Achievement + Holistic personal development

Formal curriculum

Material needs

Life skills

Graduates with valuable attributes (identified by Wits)

Academic literacies and learning skills

Career guidance

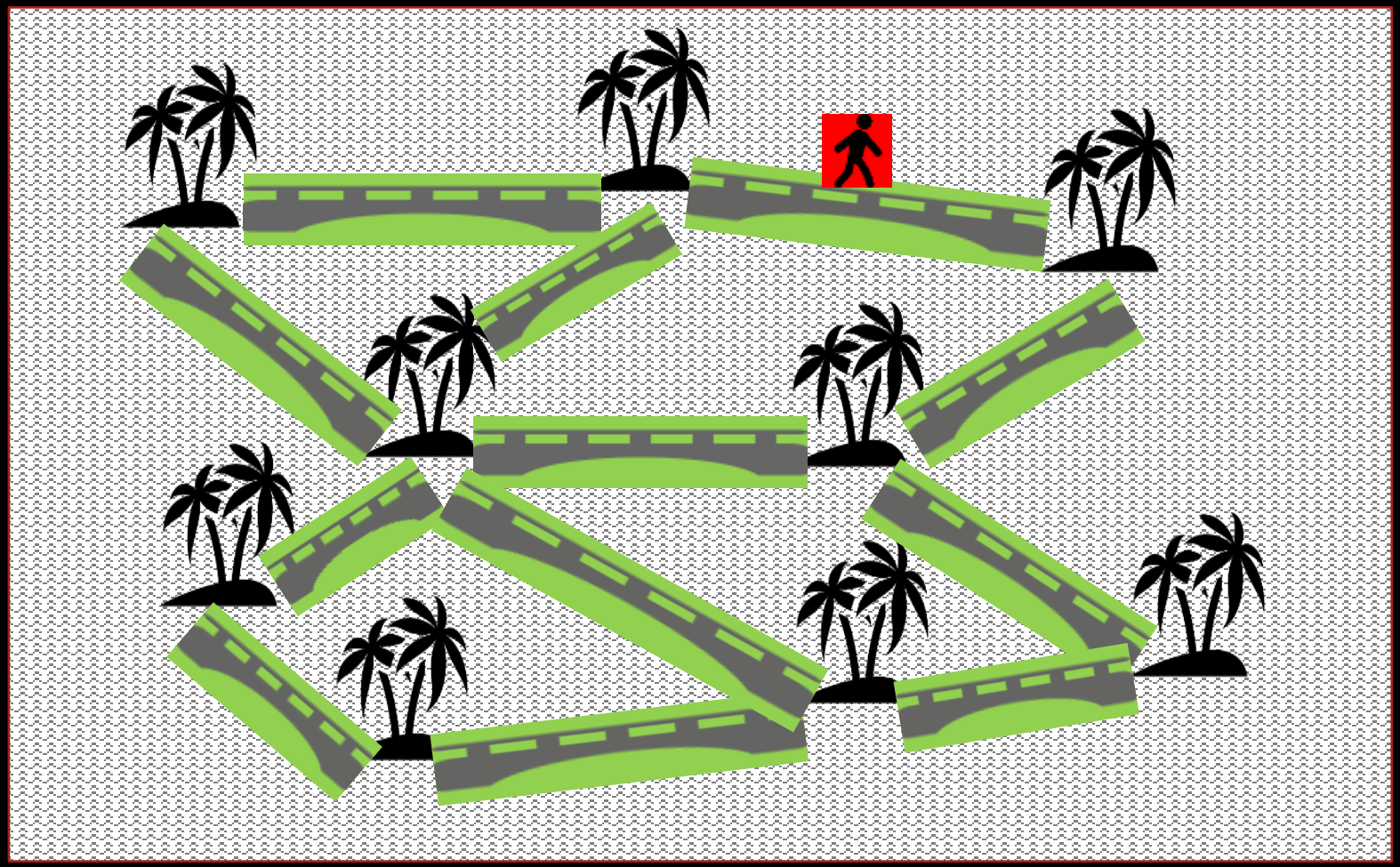
Co-curriculum

Mental and physical health and wellness

Framework needed to guide coherent, effective, holistic student success interventions

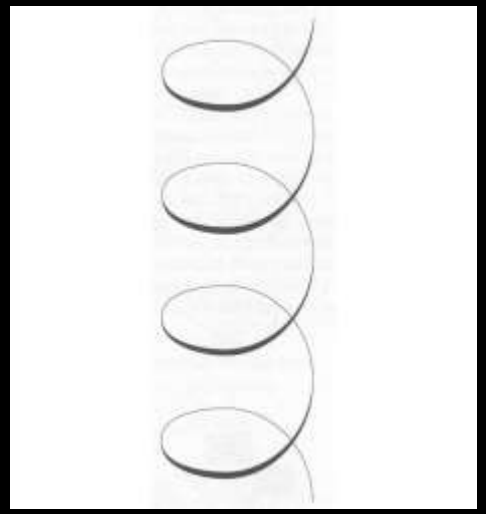
Commit to what we want

- We want the majority of our students to graduate with attributes that are personally, professionally and socially valuable
- So we want an institutional framework to guide coherent, holistic student support



GETTING BUY-IN: PEOPLE, PROCESSES, SYSTEMS

- Cycles of development – start with concept document, give presentations, circulate document, get input. Continue process with more elaborated document.
- People feel included, hear their voice, don't push back
- Use formal structures to spread the word
- Create ad hoc, cross-functional groups as needed (academics, administration, student affairs, services)
- Bring in outside experts where needed:
  - Mark Milliron, Civitas, to advise on data structures, stream of care data
  - Colleen Carmean, Ethical Analytics, to advise on data ethics

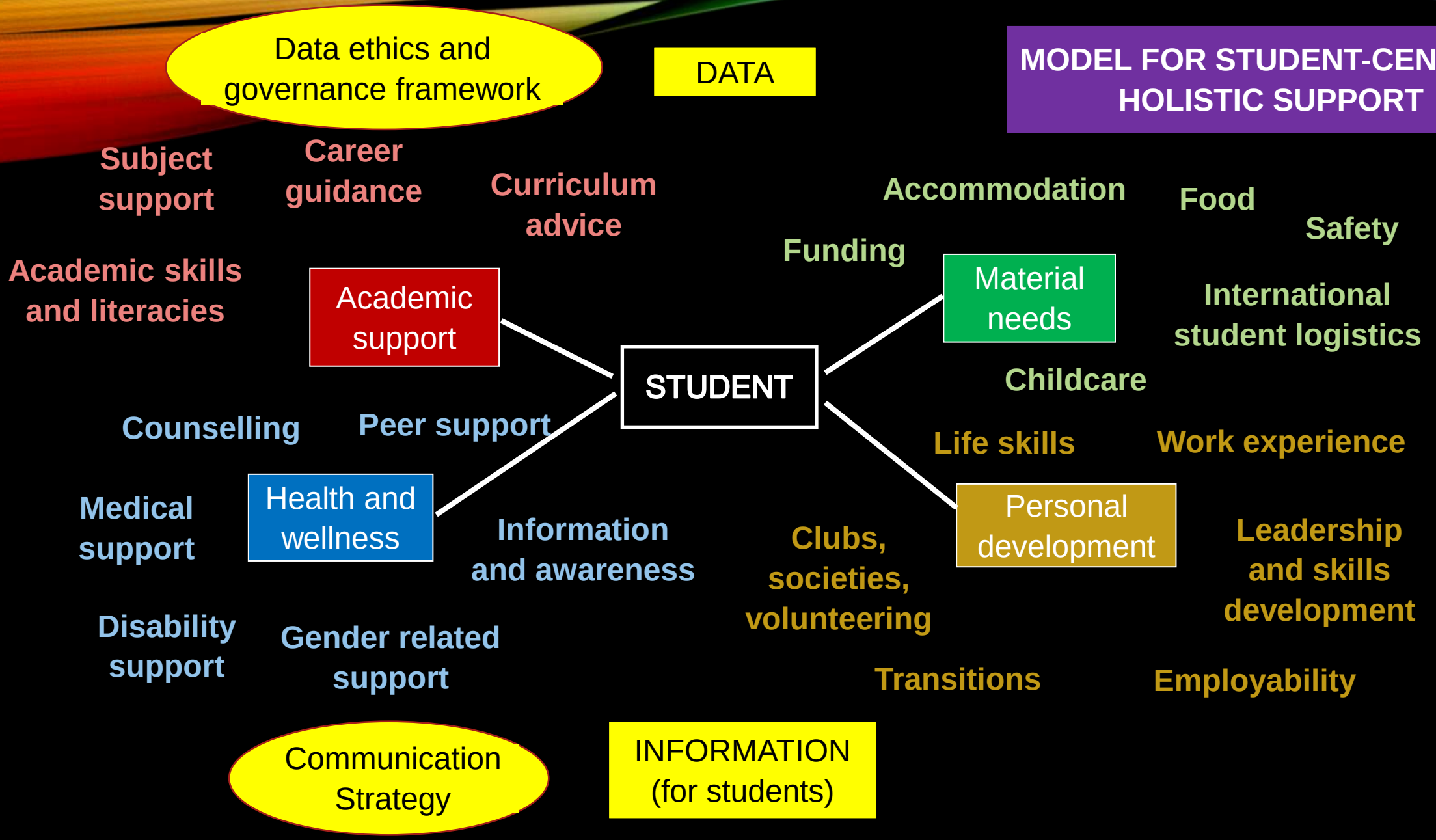


GETTING BUY-IN: SELLING THE VISION

Presentations and discussions at formal meetings of committees, task teams, working groups, including

- Senate
- Senate Teaching and Learning Committee
- Faculty Teaching and Learning Committees
- University and Faculty Student Success Committees
- Senior Management Group (directors of support divisions)
- First Year Experience Committee
- Student Affairs Advisory Board
- Student Success Framework Task Team

MODEL FOR STUDENT-CENTRED HOLISTIC SUPPORT

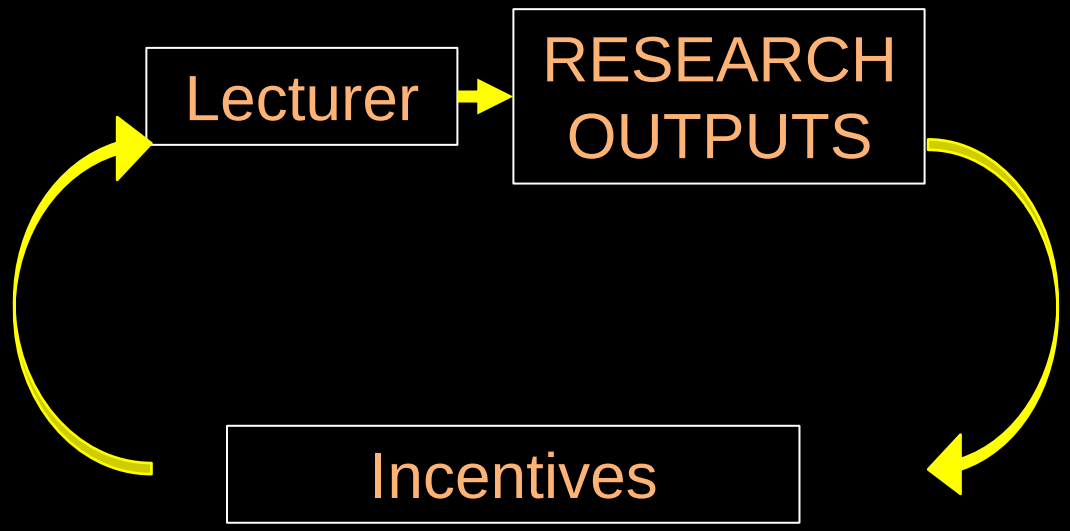


STAGE 4: BRIDGING THE GAP

- Identify causal feedback loops that undermine the goal
- Increase awareness of how the current system functions and how/where it can be changed
- Identify “low-hanging fruit”
- Identify and refine “high-leverage” interventions that have stakeholder support

ADDRESSING NEGATIVE FEEDBACK LOOP: EXAMPLE

- Developed a framework for Continuous Professional Learning for Academics as University Teachers
- Promoting conversations with Research Office, Centre for Learning, Teaching and Development and Assistant Deans: Postgraduate Affairs
- Working with Human Resources, the Research Office and Assistant Deans: Teaching and Learning to revise promotions criteria



SYSTEM CHANGE NEEDED: EXAMPLE

Students seek support from different people and units in the university. Each time they go to a new person they have to “tell their story” afresh. We don’t track which support they have received from whom.

Fix involves all student support units/staff (e.g. financial aid, counselling, food pantry, campus health), ICT, BIS, faculty student advisors, student affairs.

In the second semester of 2019 we trialled an online student success intervention site that to enable advisors to type in student number (linked at the back end to SIMS) and select issue for which student came to them (from a list of 10 categories*), and recommended referrals (from 10 options).

Can’t track if referrals taken up yet.

*life skills, academic content support, academic skills, psycho-social issues, financial, accommodation, health, food, career/curriculum, administration

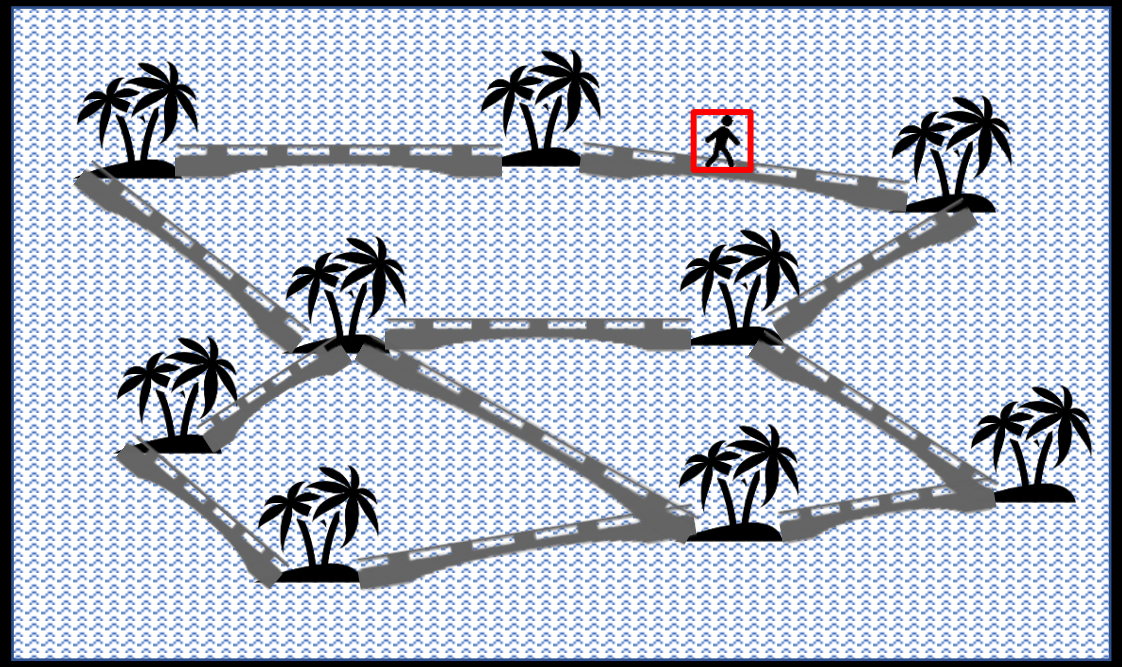
IDENTIFY LEVERAGE POINTS

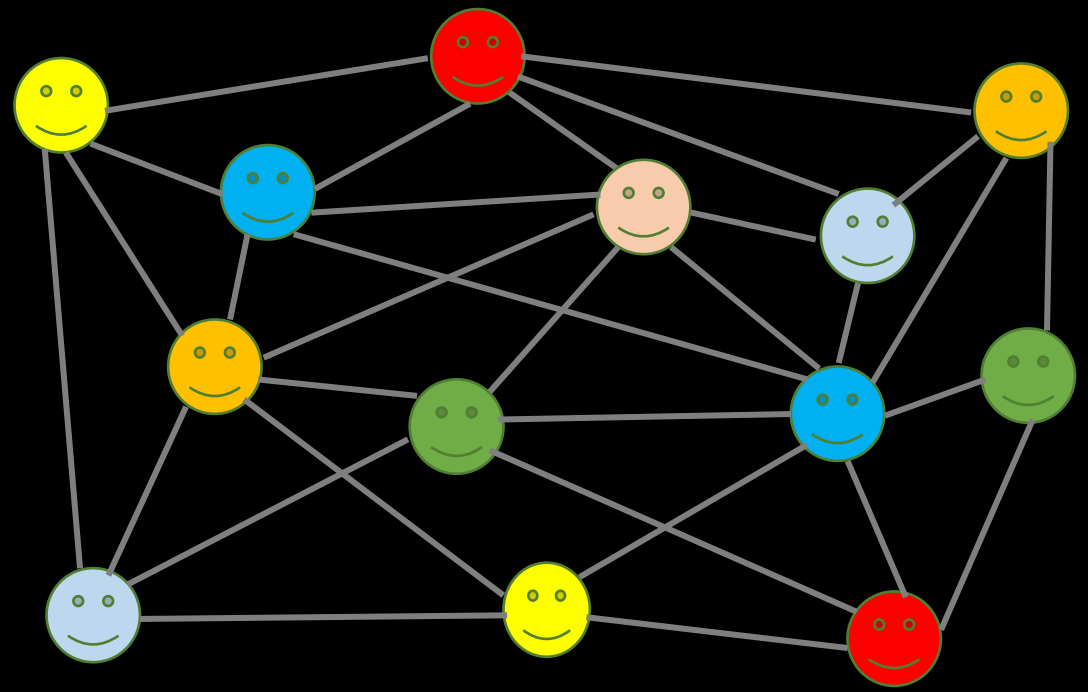
“Culture eats strategy for breakfast” (Peter Drucker)

Capitalising on institutional culture at Wits:

- Use formal processes to get formal approvals at multiple levels of the hierarchy
- Leverage very decentralised management structures at Wits to create strong networks with key people as nodes, ensure good information flows

WORK WITH INSTITUTIONAL CULTURE



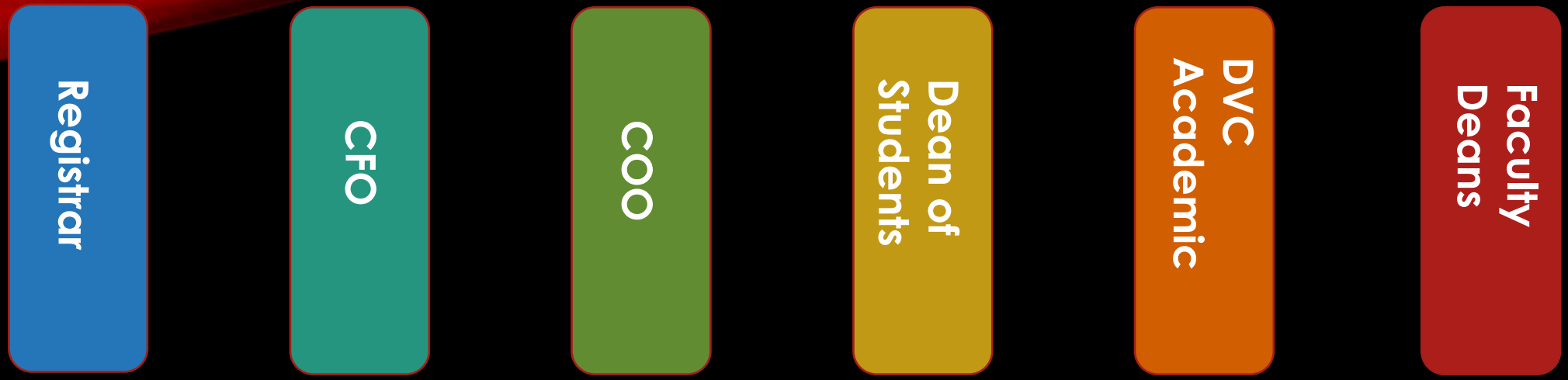


Centralising structures would not work at Wits

ESTABLISH A PROCESS FOR CONTINUOUS LEARNING AND EXPANDED ENGAGEMENT

- Use networks to quickly identify and solve problems
- Create new working groups, task teams, committees and communities of practice to facilitate collaboration, information sharing and decision making
- Develop new ways of collecting, sharing and ultilising data
- Increase accountability for poor institutional performance

Many system elements did not change but interconnections did



Student enrolment

Financial aid

ICT

Health care providers

T&L Centre

Assistant deans

Student Advisors

Psychologists

Institutional Research

FYE

QA

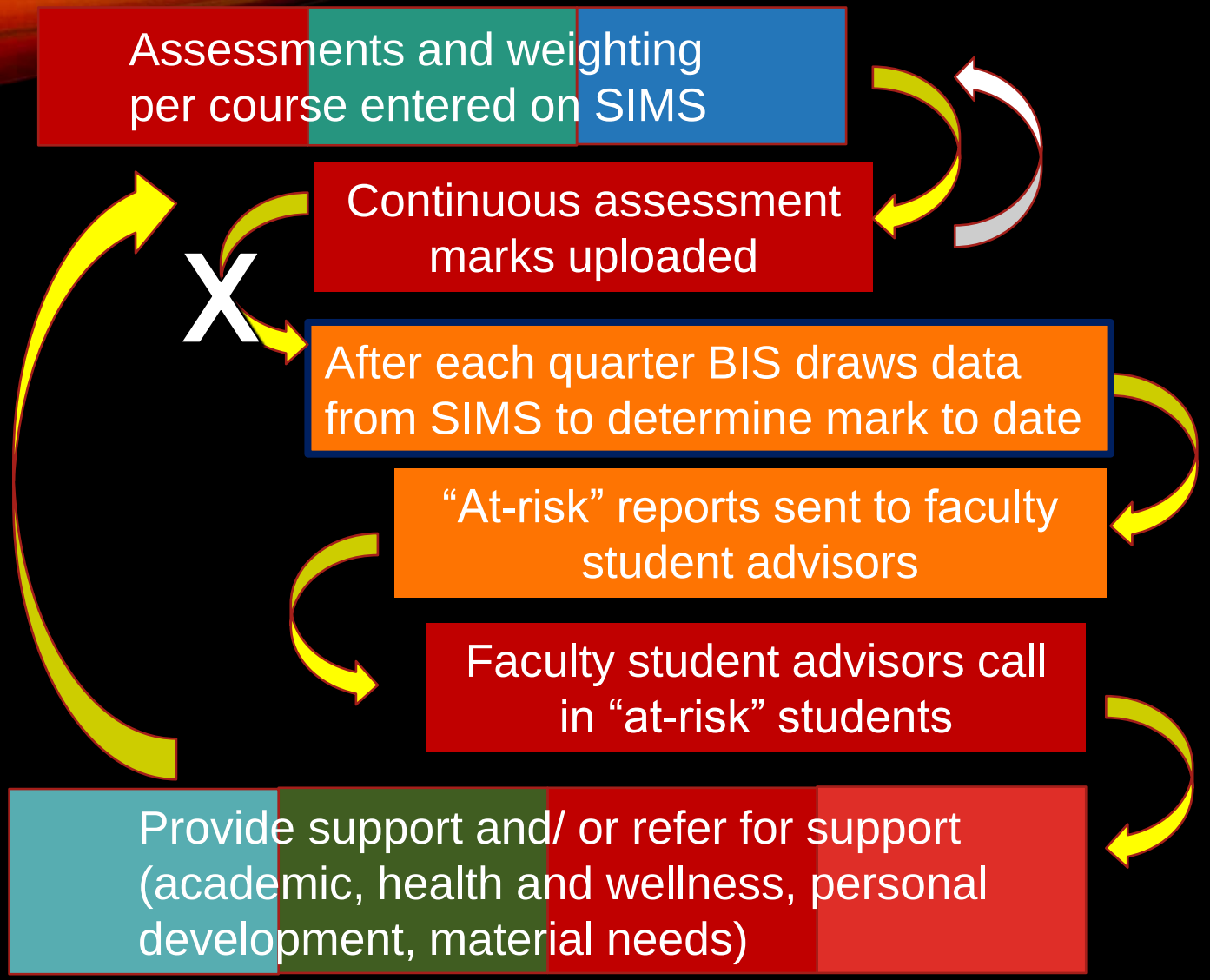
BIS

Student fees

Food security

Academics

Example: systems approach to identifying struggling students



STUDENT SUCCESS COMMITTEE

- Senior DVC and Provost (Chair)
- Senior Director: Academic Affairs
- Registrar
- Dean of Student Affairs
- Assistant Deans of the Faculties
- Director: Centre for Learning, Teaching and Development
- Heads of Business Intelligence Services, Analytics and Institutional Research, Student Academic Development
- Senior representatives from Finance, Facilities, ICT
- Postgraduate and Undergraduate student leaders

Sub-committee of Senate T&L

2020 STUDENT SUCCESS INDICATORS

Lagging Indicators

1: Increased completion rate

2: Decreased time to completion

3: Decreased disparities in completion rate by race and gender

Leading Indicators

4: Increased retention

5: Increased progression

6: Sufficient Credit Points

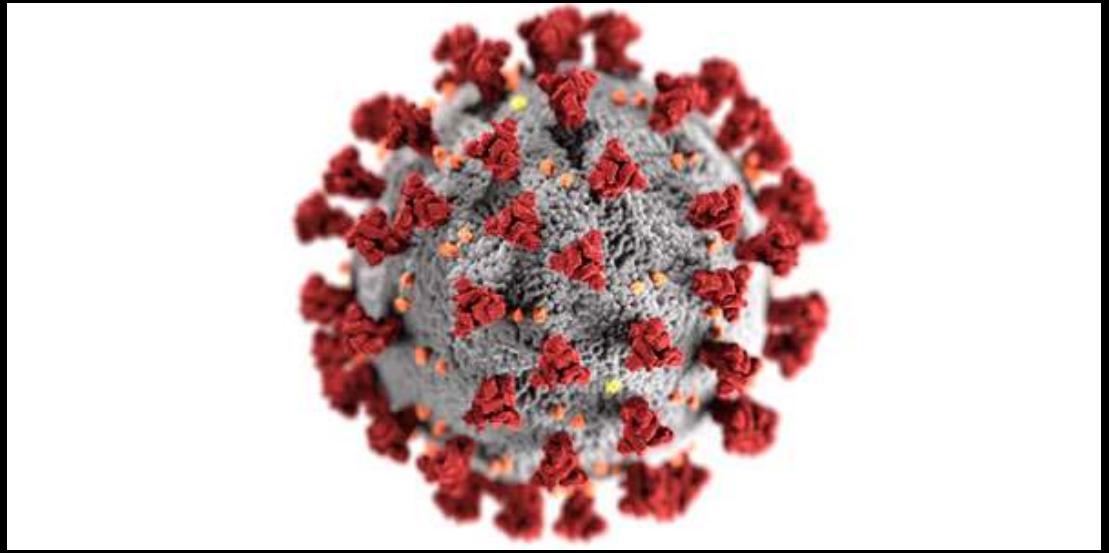
7: Decreased bottlenecks

8: Uptake of advising

2021
BIS dashboards

COVID-19

March 2020



MOBILISE THE NETWORK
SUPPORT STUDENTS TO PREPARE TO LEARN ONLINE

Faculty-based Student Advisers create online orientation sites; contact students not logging into LMS

Student Affairs receives applications from students needing laptops, couriers them out

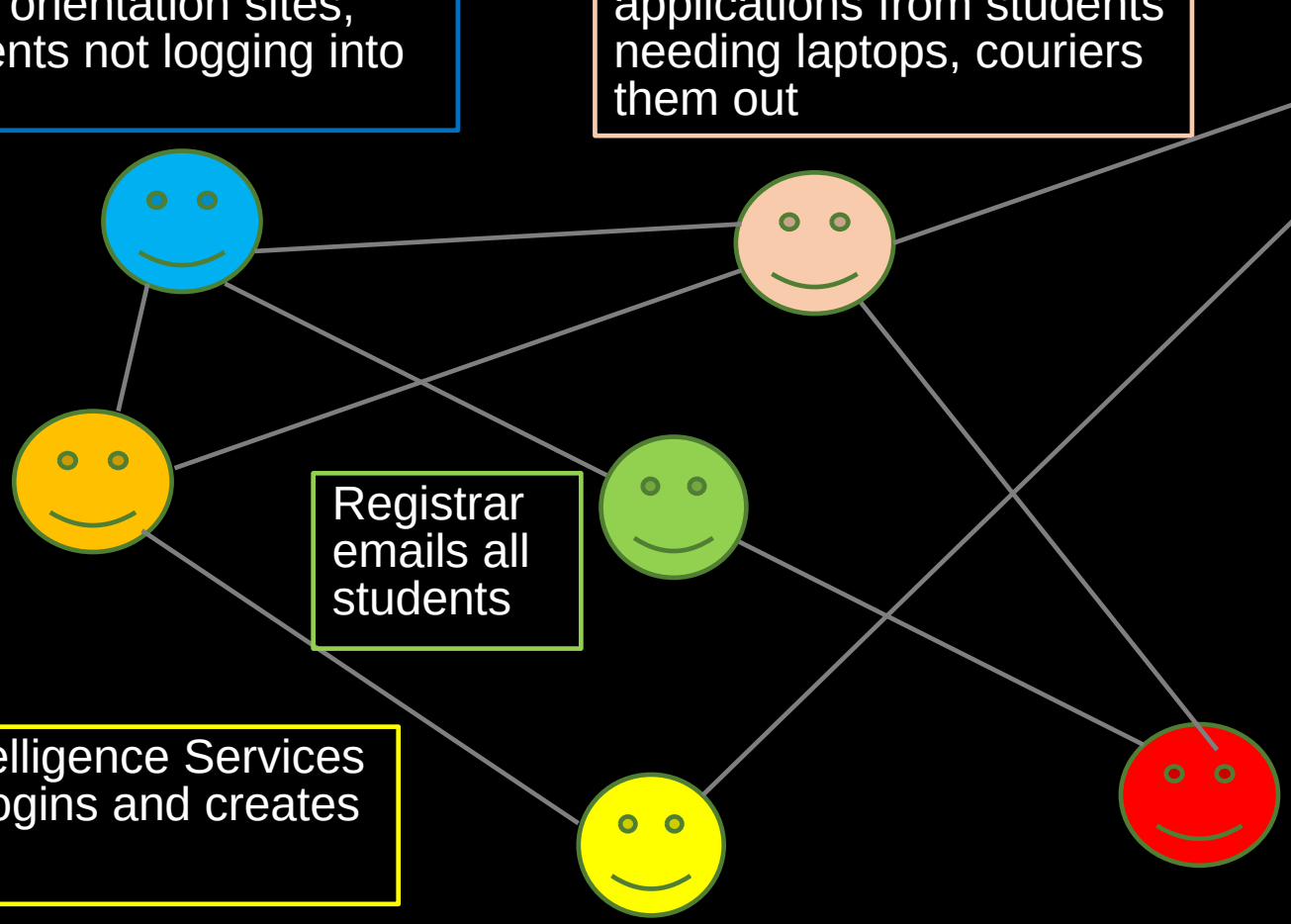
ICT negotiates good price for 5000 loan laptops, 30 GB data for all students

Assistant deans communicate with their own Faculty students

Registrar emails all students

Student Counselling produces online resources, offers online and telephonic counselling

Business Intelligence Services tracks LMS logins and creates dashboard



HELP STUDENTS LEARN ONLINE, STAY ON TRACK

Faculty-based Student Advisers provide online learning resources, offer online and telephonic support, contact at-risk students

Student Affairs helps with material and social needs; helps identify students who come back to residences as lockdown eases

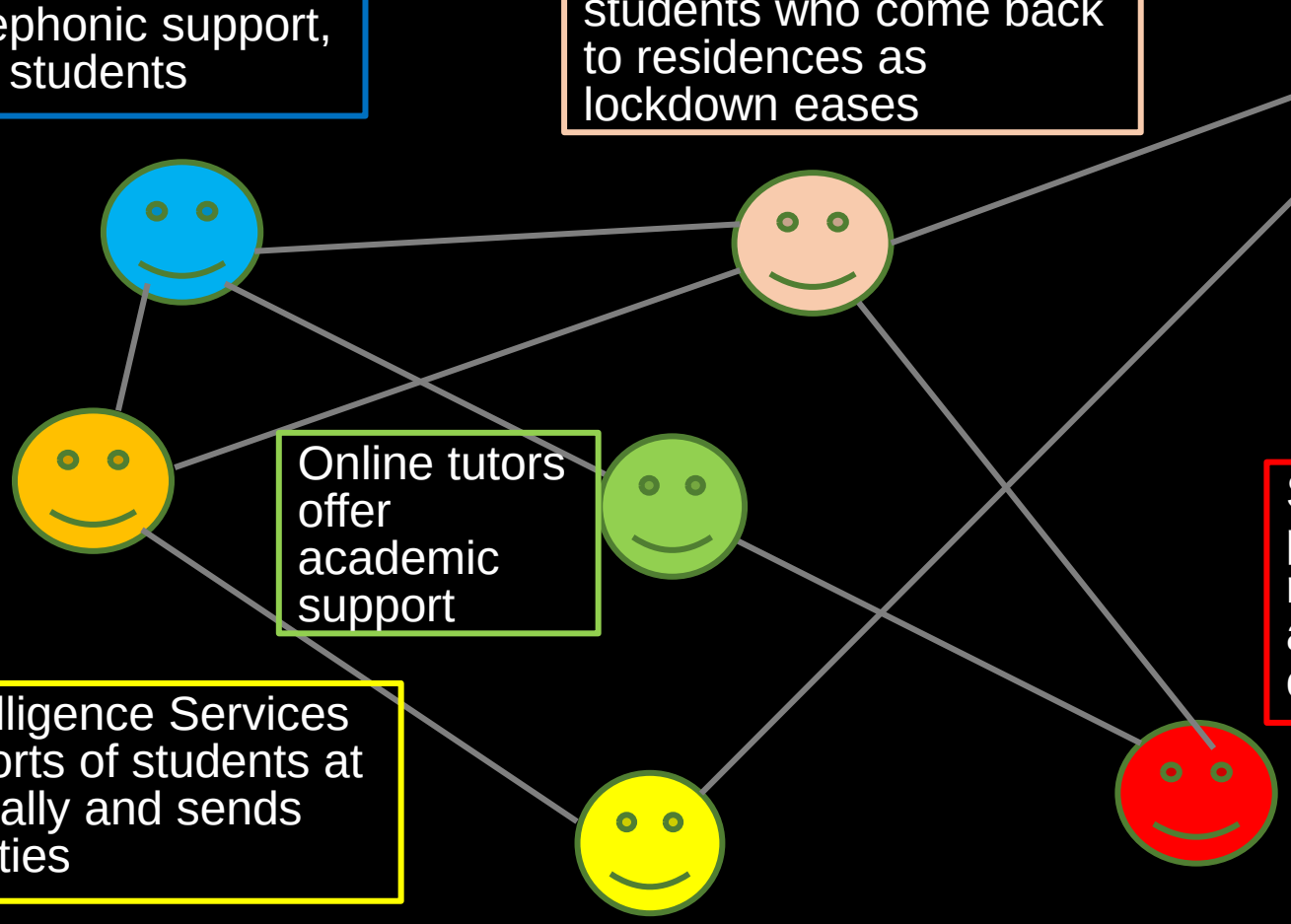
ICT provides data bundles for needy students for selected Wits-related urls

Schools urged to upload continuous assessment marks timeously to SIMS

Online tutors offer academic support

Student Counselling produces online resources, offers online and telephonic counselling

Business Intelligence Services produces reports of students at risk academically and sends them to Faculties



GATEWAY TO SUCCESS

Orientation to Academic and Student Life

FIRST YEAR transition programme 2022

A joint initiative of
student affairs and academic affairs

STRUCTURE

- Three weeks long, 7-25 February (classes start 28 February)
- Compulsory for all new FY students (about 6500)
- No extra tuition fees
- Integrated, coordinated, scheduled programme of academic, personal development and student life components
- Mix of online and on-campus activities
- In weeks 1 and 2 students came to campus for half-day of faculty-based activities and another half day of student life activities.
- Week 3 on-campus activities were all student life.
- Online academic and academic support courses run on ulwazi (Canvas) for all three weeks.

ACADEMIC CONTENT-online

Climate Change and Me

Faculty specific courses

ORIENTATION- on campus

Student Affairs

Faculty-specific

ACADEMIC SUPPORT-online

Digital abilities

Academic integrity

STUDENT LIFE- blended

Health and wellness, personal development, community-building, recreation and fun

MENTORING- blended

All students allocated a senior student mentor from their faculty

About 20 mentees per mentor

"It was really amazing. I enjoyed every bit of it. The program really helped make me feel welcome and comfortable. I know when I do start course I will be adequately prepared for anything."