Building Cape Town's resilience qualities through design thinking

Purpose

Cape Town's efforts to build skills in design thinking supports the creation of locally-relevant and innovative solutions that contribute to building **resilient individuals and communities in Cape Town.**

This case study focuses on a Design Thinking Workshop for **primary school learners**. The aim of the workshops was to provide learners with a **new set of skills** which they can employ when **problem solving for real world challenges**.

It is written for decision makers who are involved in **education, skills development and innovation**, as well as those invested in **building resilience** to physical, social and economic challenges.

It specifically is written from GreenCape's perspective as a skills development partner in these initiatives and includes:

- an **overview of design thinking** and how it can **support resilience**;
- a summary of the activities done with primary school learners; and
- **key themes** and **general lessons** that emerged from this approach.

LESSONS LEARNED

- ✓ Focus on issues that have easily understood and relatable impacts
- ✓ Target a youth cohort which is mature enough to understand the overarching philosophy, while being young enough to comfortably express creative ideas (ideally Grades 10 - 12)
- ✓ Expand the experience by supporting youth to explore real-life examples of innovation in their space

Cape Town aspires to be a resilient city and is working in partnership with 100 Resilient Cities (100RC), pioneered by the Rockefeller Foundation. Cape Town is developing a roadmap to enable the city to become more resilient to the growing physical, social and economic challenges. This case study is part of a series highlighting how Cape Town is building resilience.

GreenCape | CITY OF CAPE TOWN ISIXEKO SASEKAPA STAD KAAPSTAD | INVEST CAPE TOWN | RESILIENT CAPE TOWN | d-school

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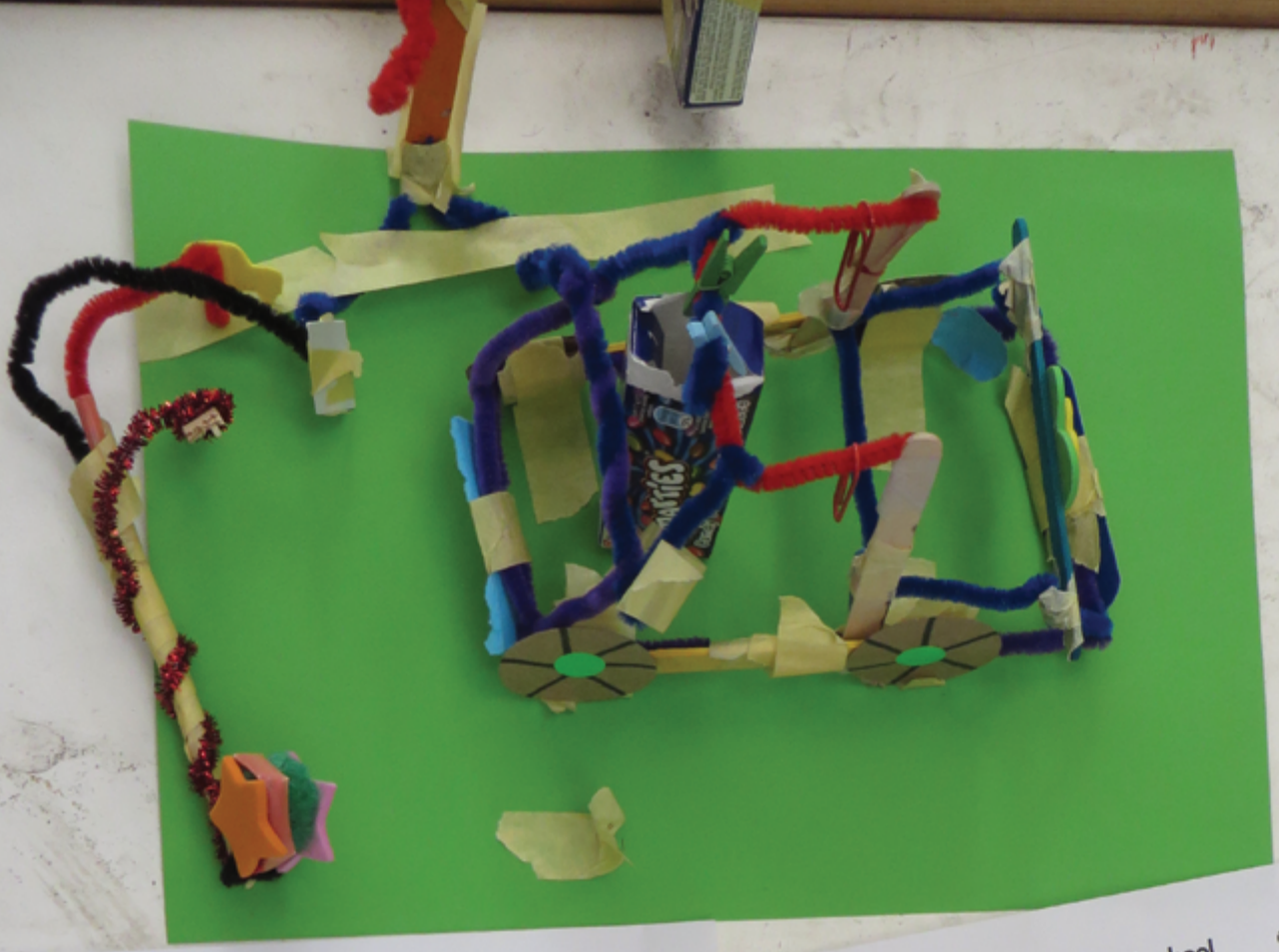


Storyline Template

d-school

Once upon a time there was ___your person___.

Every day they would ___current scenario___. Then one day, ___they discovered your idea___

and because of that, ___they did something different___. Ever since then,

Once upon a time there was... A man who liked to waste water. T... he realized that water was expensive. And he stopped wasting ~~water~~ water. He used a hose-pipe. After a couple of weeks A nieghbour told him to use a bucket. Then he start to use a bucket. ~~Ever since~~ then he used a bucket and sometimes a ~~machine~~ machine Now he knows ~~to~~ How important it is to save water.

Idea Template

d-school

Team name: Infinite' Group!!!

Draw your idea:

Describe your idea in one sentance: A machine that use steam to clean the car.

Who is going to use it?	Why will they love it?	How does it work?
People who Wash there cars	Because it saves water	I uses steam to clean the car.

Introduction

This case study tells the story of how the **University of Cape Town's Hasso Plattner Institute of Design Thinking** (d-school), in partnership with GreenCape and the City of Cape Town (CoCT), is building design thinking skills with individuals and communities in Cape Town.

What is resilience?

100 Resilient Cities (100RC) describes resilience as "the capacity of individuals, communities, institutions, businesses and systems within a city to survive, adapt and grow, no matter what kind of chronic stresses and acute shocks they experience".

Chronic stresses "weaken the fabric of a city on a day-to-day or cyclical basis" while acute shocks are "sudden sharp events that threaten a city". Building resilience to these stresses and shocks will require individuals, communities, institutions, and all spheres of government, to play a variety of roles and develop effective partnerships.

Problem

Building resilience is essential for cities that face **increasing uncertainty** and **new challenges** that threaten the well-being of its citizens. This is especially important when looking at the diversity and complexity of potential shocks and stresses.

The diagram on the next page summarises the chronic stresses (14) and acute shocks (12) that have been selected and prioritised for Cape Town in the Resilience Strategy[1].

Some of these shocks e.g. the recent severe Western Cape drought[2], have already provided a **strong evidence-base** for the **value of collaboration and partnerships**, particularly as chronic stresses, such as climate change and unemployment, can:

- **increase the severity and likelihood of shocks** in the future; and
- **further impact the city's ability to respond and thrive** in moments of shock.

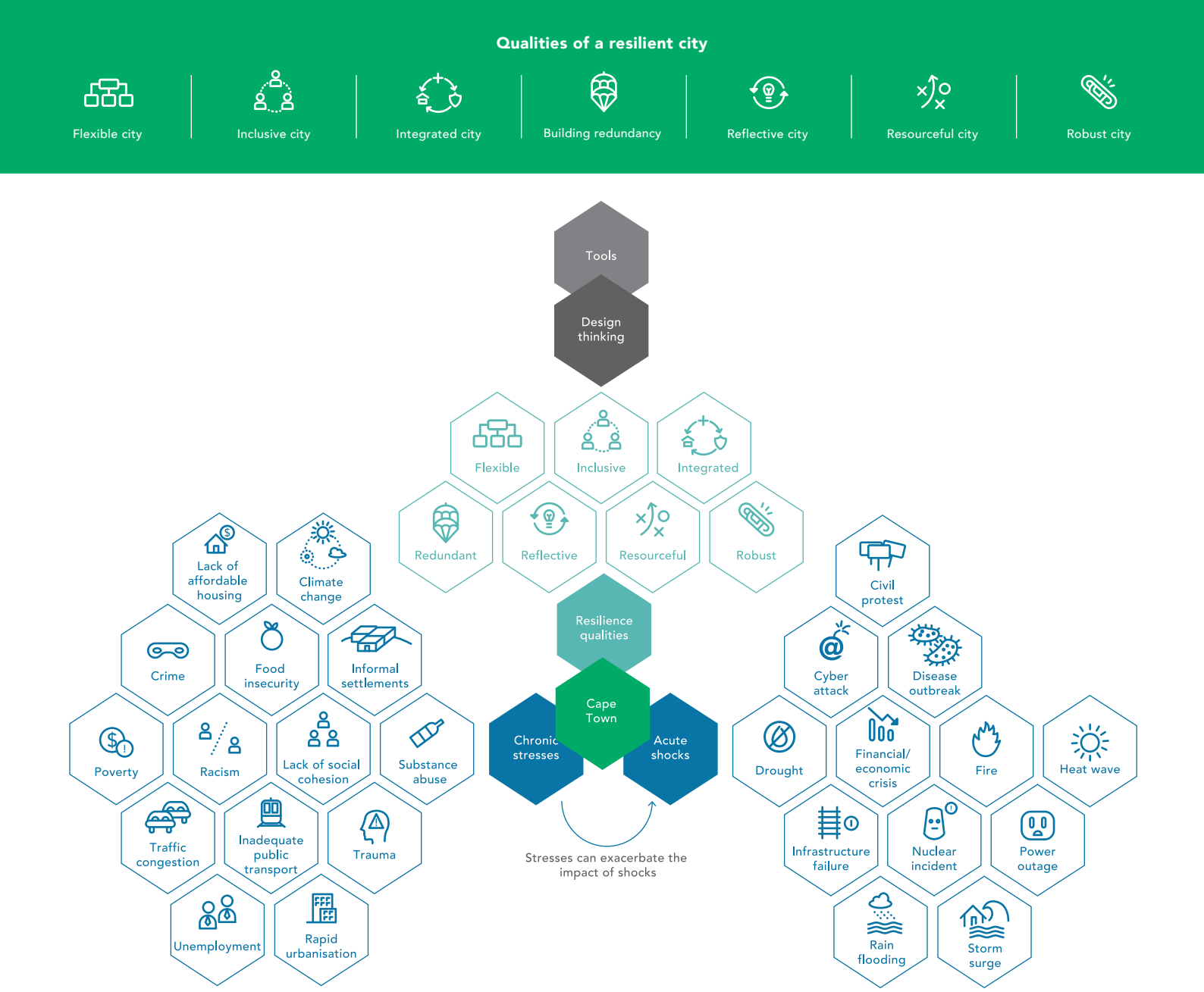
The Cape Town Resilience Strategy[1]

The City of Cape Town (CoCT) is developing a strategy to support efforts to build resilience. This is a holistic approach – one that does not simply prepare for shocks, but ultimately understands:

- the relationship between shocks and stresses;
- how stresses impact the city's resilience against shocks; and
- what qualities, e.g. resourcefulness and flexibility, are needed to build resilience.

[1] *See the CCT Preliminary Resilience Strategy for more detail. Available at https://resource.capetown.gov.za/documentcentre/Documents/City%20research%20reports%20and%20review/CCT%20PreliminaryResilienceAssessment.pdf)*

[2] *See https://www.greencape.co.za/library/?Keywords=resilience&Water=1&CaseStudy=1&DateFrom=&DateTo=&action_doSearch=Search*



Solution

Using design thinking to build resilience

Design thinking is an empathetic **human-centred approach** which embraces **ambiguity** (i.e. inexactness or uncertainty). It sees challenges and constraints as inspiring, and is thus a useful tool to build essential qualities for resilience.

Design thinking starts with a context-specific understanding of the end-user and encourages:

- **different perspectives**;
- **collaboration** between diverse stakeholders;
- **innovation** through experimentation and the development of prototypes; and,
- designs to **fail early, safely, quickly and inexpensively**, which can accelerate the design of an **appropriate and effective solution**.

It is particularly effective in **framing problems** in a way that allows for the design of solutions that have greater **integrity** and **resilience** i.e. are more responsive to the community's needs[3].

The design thinking approach is not new and has been used to **develop contextual resilience frameworks** for specific communities in South Africa and in Africa more broadly (see box on following page).

[3] *Schmiedgen, J., Rhinow, H., Köppen, E., & Meinel, C. (2015). Parts Without a Whole? – The Current State of Design Thinking Practice in Organizations (Study Report No. 97) (p. 144). Potsdam: Hasso-Plattner-Institut für Softwaresystemtechnik an der Universität Potsdam. Retrieved from https://thisisdesignthinking.net/why-this-site/the-study/*

Qualities of a resilient city

Flexible city | Inclusive city | Integrated city | Building redundancy | Reflective city | Resourceful city | Robust city

"It [design thinking] is a combination of different layers. One is the mindset, one is the method and one is the culture. It works best, when you are fully into all the levels."

Survey respondent in a design thinking study report (Schmiedgen et al., 2015)

The resilience frameworks were developed, in part, through **design thinking approaches** which supported the creation of a platform responsive to community needs, and facilitated team-based learning and engagement for collaborative innovation. This is outlined in greater detail in the RAN State of African Resilience Reports 2015 and 2017.

A focus on youth development

Design thinking can be particularly beneficial for youth development as the **approach avoids presupposed solutions** and encourages **'thinking through doing'** in order to **gain further insights** and **improve designs**. It thus supports skills such as **complex problem solving, critical thinking, creativity, coordination, teamwork and cognitive flexibility** – skills which are among those predicted to be **highly desirable skills in the future** (Future of Jobs Report, World Economic Forum, 2015).

How ResilientAfrica Network's (RAN) Resilience Innovation Labs (RILab) uses design thinking to support improved resilience

The ResilientAfrica Network (RAN) is a university-led university-led partnership established in 2012. It aims to build and sustain the resilience of target sub-Saharan communities. RAN, supported by two USA-based universities, is headquartered in Uganda. It has engaged 20 universities across 13 countries in Africa and has created a network of four Resilience Innovation Labs (RILabs) in Eastern Africa, Southern Africa, West Africa, and the Horn of Africa, each with their own sub-networks, target communities and contextual resilience frameworks.

South Africa hosts the Southern Africa RILab (SARILab) at the University of Pretoria and, with its partners, focuses on building resilience in specific communities in Malawi, Zimbabwe and South Africa. The SARILab specifically supports:

- the development of local adaptive capabilities and innovative solutions to reduce the impact of chronic diseases, particularly HIV and AIDS; and
- access to sustainable income generation.

Approach

This particular case study focuses on lessons learned from a Design Thinking Workshop for 180 Grade 6 learners from the Wesfleur Primary School in Atlantis. The workshop, hosted by the CoCT, GreenCape and d-school, was run at Cape Town City Hall on the 18 August 2017. It formed part of the **Open Design Festival** and a broader CoCT-initiated **Green Water Design and Innovation Programme**, where human-centred design is used as a way to generate creative solutions.

The workshop introduced the **concept of design thinking** and focused on "saving water at home and school" – a topic that raised awareness of the severity of the drought crisis and the need for behavioural changes in the consumption of water. Atlantis youth were specifically targeted as:

- Atlantis contains an industrial Special Economic Zone that focuses on green (clean) technologies and several initiatives to support the development of **appropriate skills**; and
- design thinking supports innovation, which is important for industrialisation and resilience.

The learning objectives were:

- **increased awareness** of a complex real world problem;
- increased **empathy** for users exposed to this problem;
- introduction to, and experience of, the **design thinking approach** – specifically practicing the rapid and creative approach to verbalizing, showing and sharing their ideas; and
- working collaboratively with peers to develop potential solutions.

"Innovative solutions are needed to address this challenge, and who better to involve and "tap" into for finding potential alternatives than the youth."

[4] *RAN Bulletin, Issue 1, March 2014. Available at http://www.ranlab.org/download/RAN_Bulletin.pdf*
[5] *RAN State of African Resilience Reports 2015 and 2017. Available at https://www.ranlab.org/state-of-african-resilience-report-2017*

Tech

Idea Template

d-school

1

Team name: Infinite' Group!!!

Draw your idea:

Describe your idea in one sentance: A machine that use steam to clean the car.

Who is going to use it?	Why will they love it?	How does it work?
People who Wash there cars	Because it saves wate	I uses Steam to clean the car.

Storyline Template

d-school

Once upon a time there was ___your person___.

Every day they would ___current scenario___. Then one day, ___they discovered your idea___,

and because of that, ___they did something different___. Ever since then, ___future scenario___.

Once upon a time there was... A man who liked to waste water. Then he realized that water was expensive. And he stopped wasting water. He used a hose-pipe. After a couple of weeks A nieghbour told him to use a bucket. Then he started to use a bucket. Ever since then he used a bucket and sometimes a machine. Now he knows How important it is to save water.

Tech

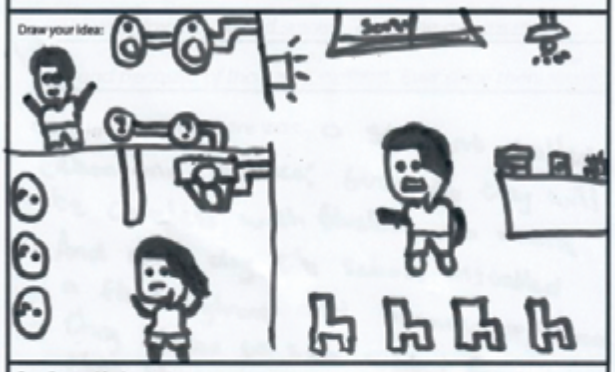
Idea Template

d-school

3

Team name: VENIX

Draw your idea:



Describe your idea in one sentance: This school put in fluch signren

Who is going to use it?	Why will they love it?	How does it work?
The school and the people that waste water.	This is how we Can save Waterin South Afric	If you flush more than two times the sigrane will go off then the principal will come.

Storyline Template

d-school

Once upon a time there was ___your person___.

Every day they would ___current scenario___. Then one day, ___they discovered your idea___,

and because of that, ___they did something different___. Ever since then, ___future scenario___.

Once upon a time there was... a student called Ethan and Teyonce. Everyday they will be careless with flushing to much And one day the school installed a flush sigrane and because of that they started to save water. Ever since then the school used the least water.

All learners were required to participate and collaborate as roles were alternated so that they could take turns to lead the different stages of the design thinking process.

This process included:

- **"How might we" questions** which served as the basis from which they could launch their ideas for addressing the challenge. For example, "How might we increase student motivation to reduce water consumption at school where there is no reward for changing their water use behaviour?"
- **Alternative brainstorming techniques to introduce constraints** that forced students to think more laterally about how they could turn their idea into reality.
- **Collectively constructing a 3-dimensional prototype** of the group's solution using materials such as pipe cleaners, shapes, scissors, paper, board, pegs, straws etc.
- **Capturing ideas as a plot to a simple story**. This "story" gave their idea context and made it "real" for others.

The template is shown at the back of the case study with a few examples from individual groups – one using steam to clean cars and another using a "signrin" (siren) to reduce individual flushing of toilets.

"…the cleantech space is a particularly rich area for design thinking, as it is full of complex problems - something to keep in mind, as the Western Cape looks to employing different methodologies in solving the drought crisis."

Dr Rael Futerman, Programme Manager, d-school, UCT

Impact

This workshop, among other work done by Green Water Design and Innovation Programme **strengthened the innovation ecosystem** between the CoCT, GreenCape, and d-school. It was the **largest design thinking workshop** ever delivered by the d-school and was **targeted to its youngest audience**.

In line with its learning objectives, the workshop raised awareness of the need to save water and led to a number of proposed interventions which were developed by the Grade 6 students themselves. These ideas, generated from human-centred (end-user) thinking, can be summarized into the following themes:

- Catchment of water
- Purification of water
- Harnessing of technology to conserve water
- Leak detection
- Penalties for wastage
- Appointment of water ambassadors
- Education on water conservation
- Competitions as incentives to save water

Details on the proposed solutions under each of theme is provided in the graphic overleaf.

Importantly, this case study demonstrated the **benefit of collaborative partnerships** which support learners to **solve for real world challenge**s and allows them to innovate and design prototypes **well-suited to their schools and households**.

Qualities of a resilient city

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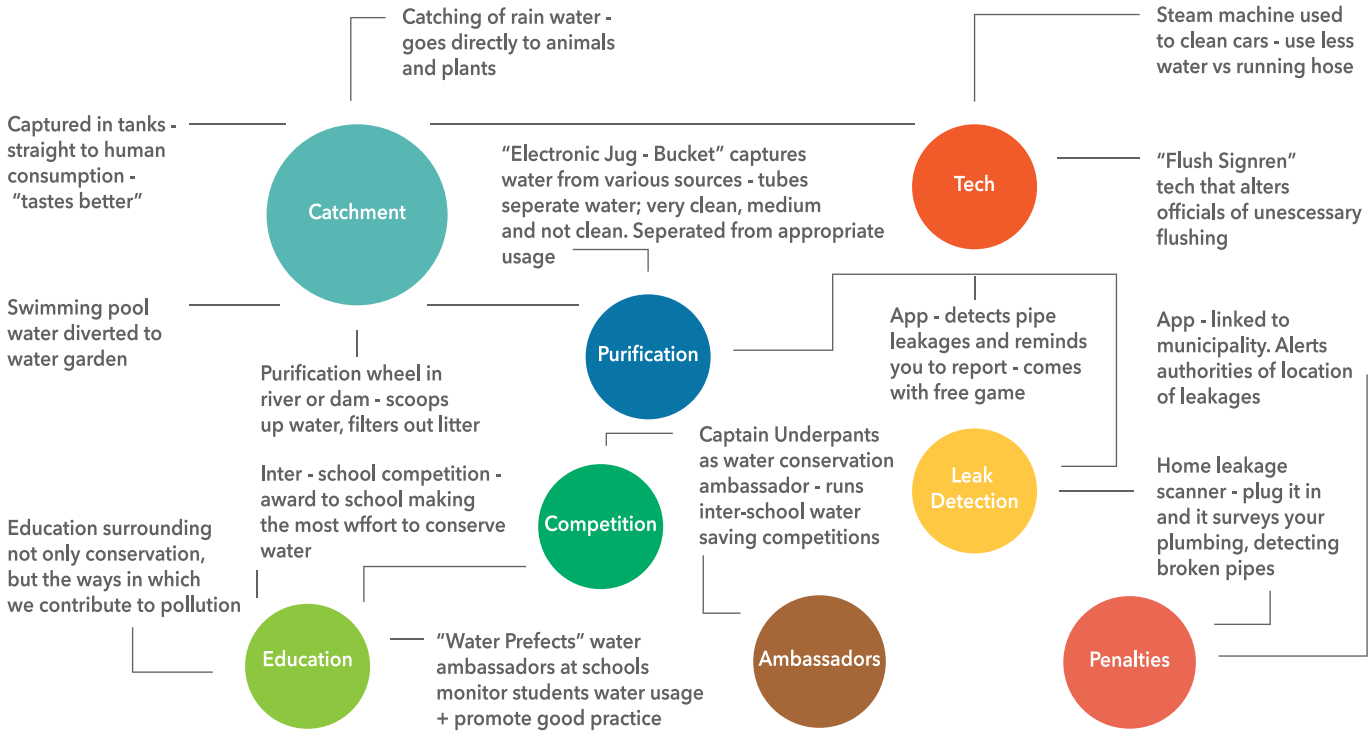

Lessons learned

1. Focus on complex issues with impacts that are easily understood

The technical knowledge and high quality ideas from the Grade 6 students surprised the facilitators, given the complexity of water management and governance. This was largely attributed to the communications strategy executed throughout the drought. Greater detail on the coordination of partners and alignment of messaging is described in other case studies.[6]

2. Target an older youth cohort

UCT's d-school had been considering opening design thinking courses to younger people and the workshop with the Grade 6 students, the youngest cohort that d-school had ever worked with, represented an opportunity to test this out.

Although the workshop met the learning objectives and demonstrated that students were able to conduct the exercises with enthusiasm and an open mind, the facilitators indicated that there is a greater appreciation for how the design thinking process works with older youth (ideally in Grades 10 - 12). This represents a group that is mature enough to understand the overarching philosophy, while being young enough to comfortably express creative ideas.

3. Expand the experience

Attending the Open Design Festival was perceived as an exciting school outing for the school children and they thoroughly enjoyed the design-thinking workshop. However, for many of the children it was the first time that they had come into the city centre and, if a similar activity is planned in the future, it is recommended that time is included for the children to explore real-life examples of innovation in an urban landscape.

[6] *https://www.greencape.co.za/assets/Uploads/20190409-GreenCape-Resilience-Reports-WaterA-FA-Interactive.pdf*

For more information and support contact GreenCape's skills development desk: info@greencape.co.za or call (021) 811 0250. Additional resources on improving skills development are available from: www.greencape.co.za/content/focusarea/skills-development