Contributing to the sustainability of an NPO through SD

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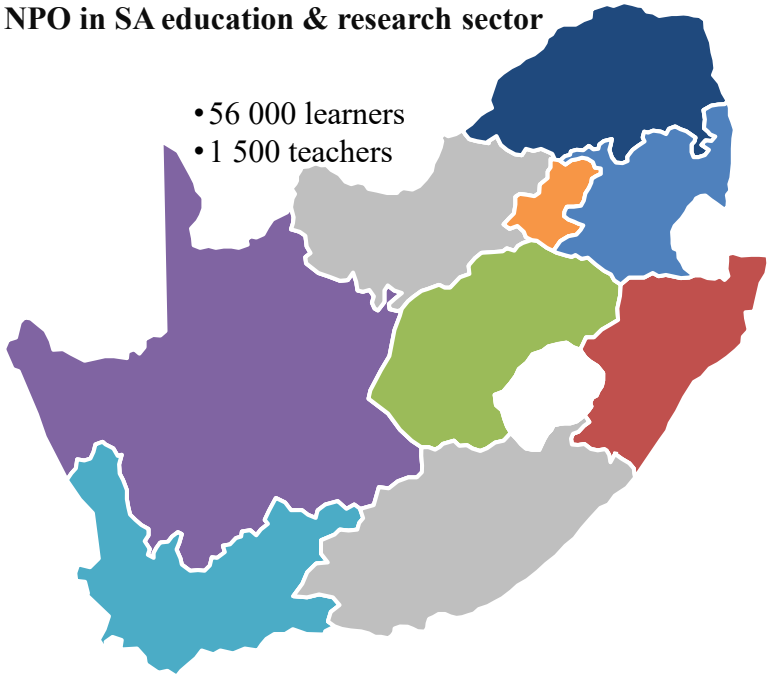
Outline

- Background
- Method
- Results
- Discussion
- Conclusion

Background

NPO in SA education & research sector

- 56 000 learners
- 1 500 teachers



- **Limpopo** 4 schools
- **Mpumalanga** 25 schools
- **Gauteng** 35 schools
- **KwaZulu-Natal** 42 schools
- **Free State** 9 schools
- **Northern Cape** 10 schools
- **Western Cape** 31 schools

Sustainable management of resources & processes to satisfy needs and build resilience over long term

Model

COVID-19

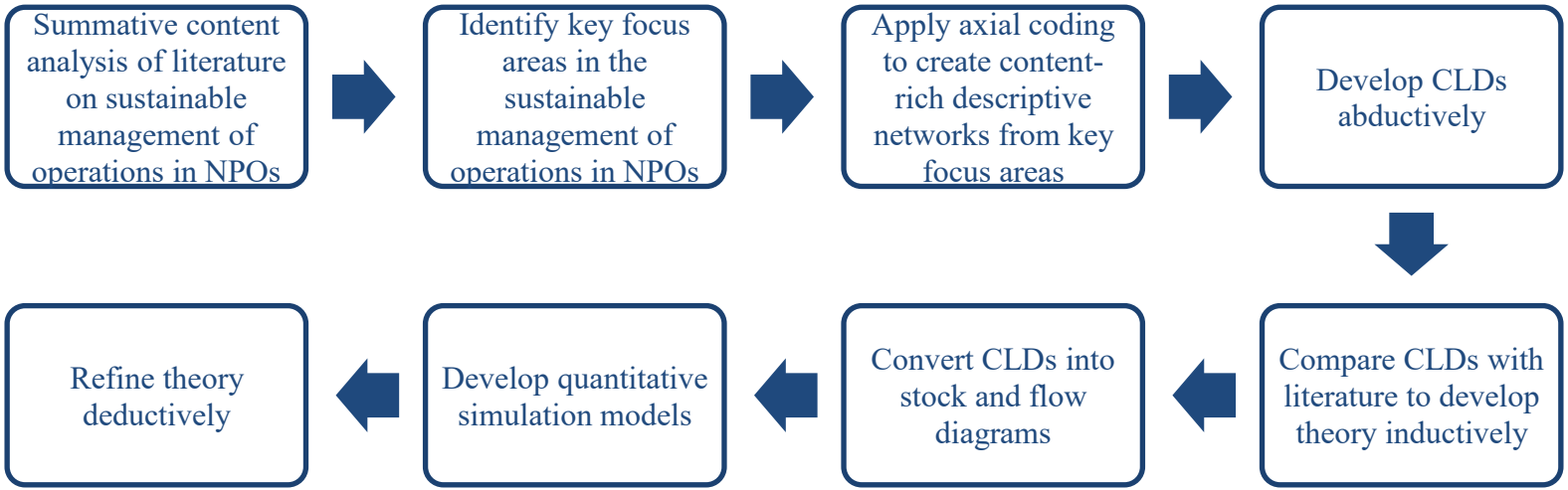
- Significant donors withdrew
- No reserve funds
- Support teachers & learners online
- Prepare to assist schools when re-opening
- Donor relations affected by social distancing

Many NPOs in SA and globally are under pressure due to political and economic challenges and disasters such as COVID-19

Method

Action design research

System dynamics process to develop theory on the NPO's situation



Results

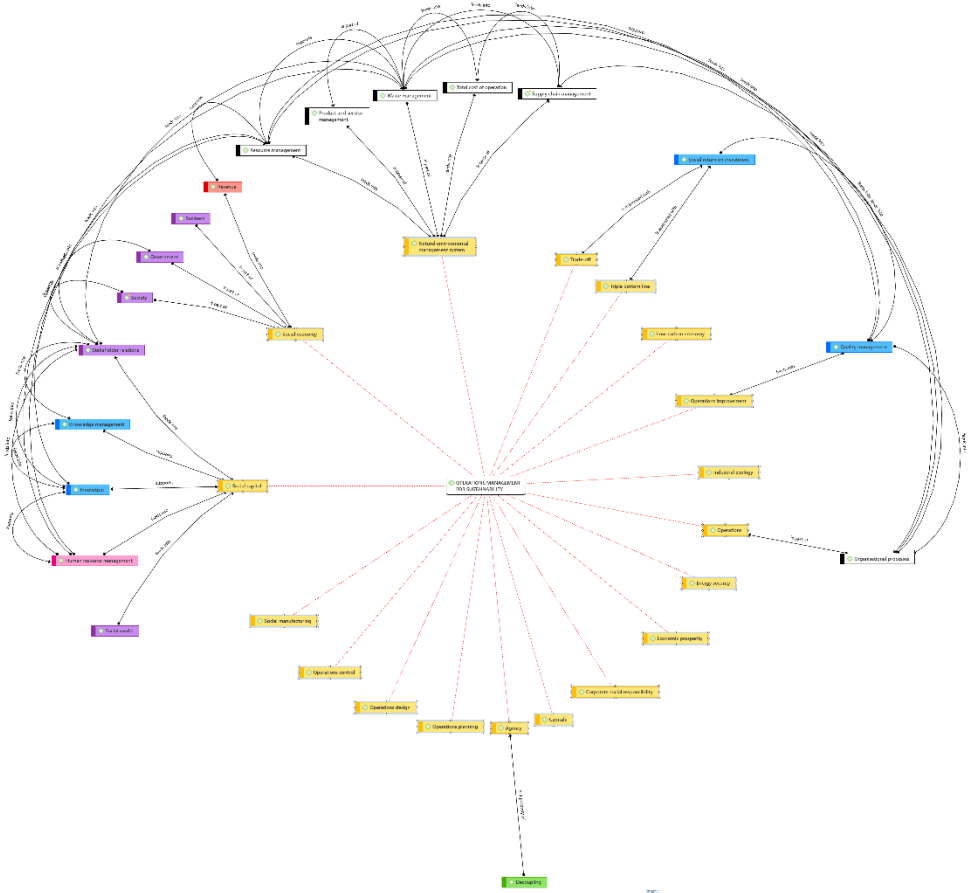
ATLAS.ti

Summative content analysis

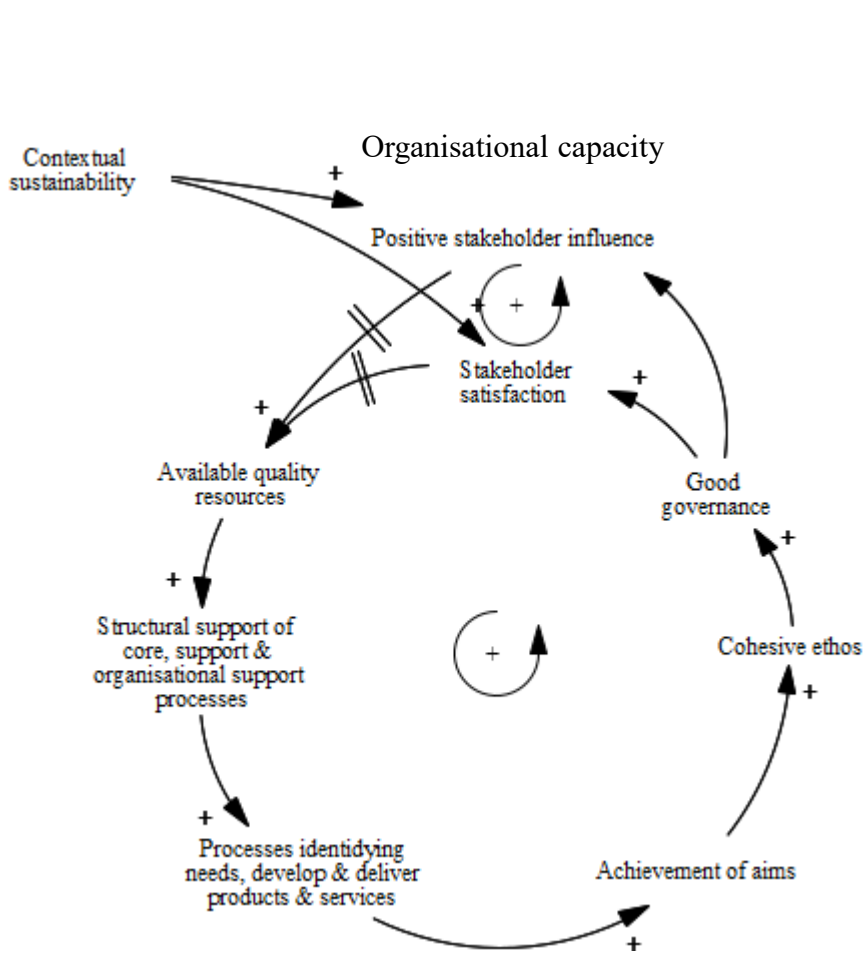
Products & services
Stakeholders
Governance
Leadership
Funding
Human resources
Organisational culture
Technology

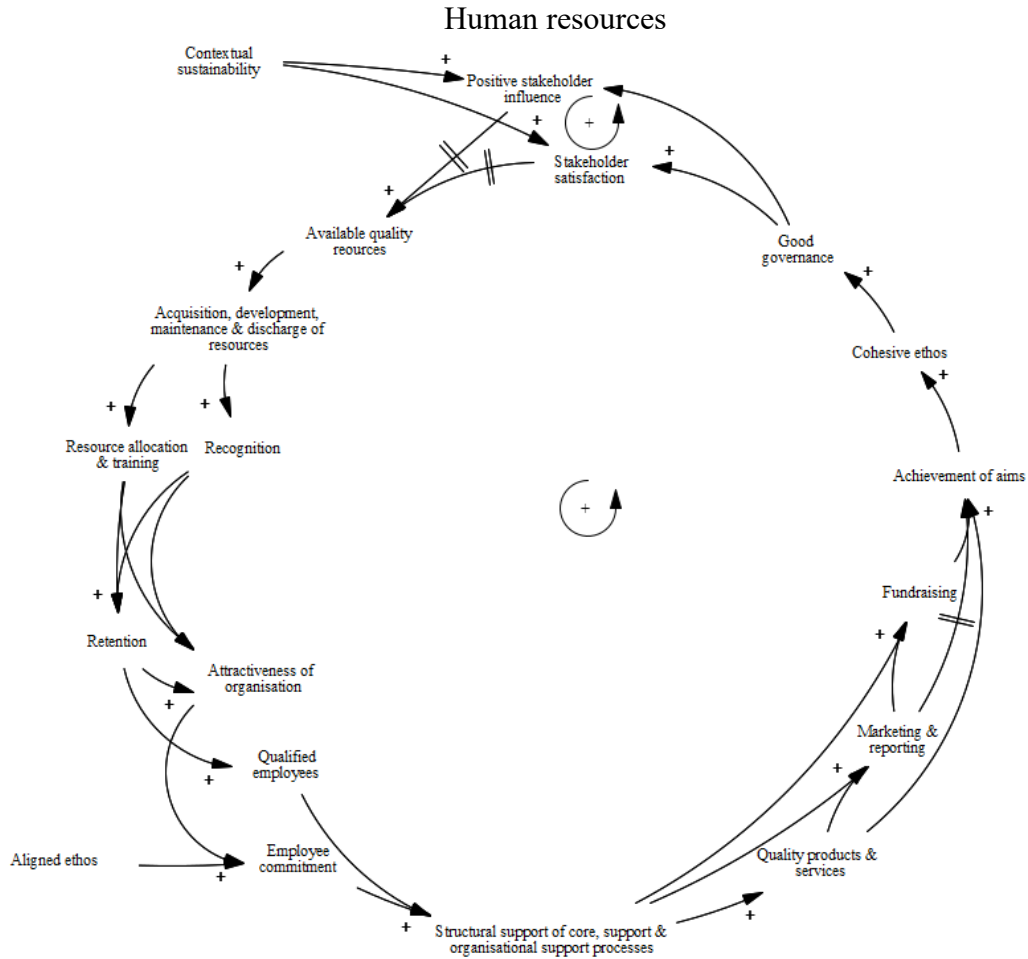
ATLAS.ti

Axial coding



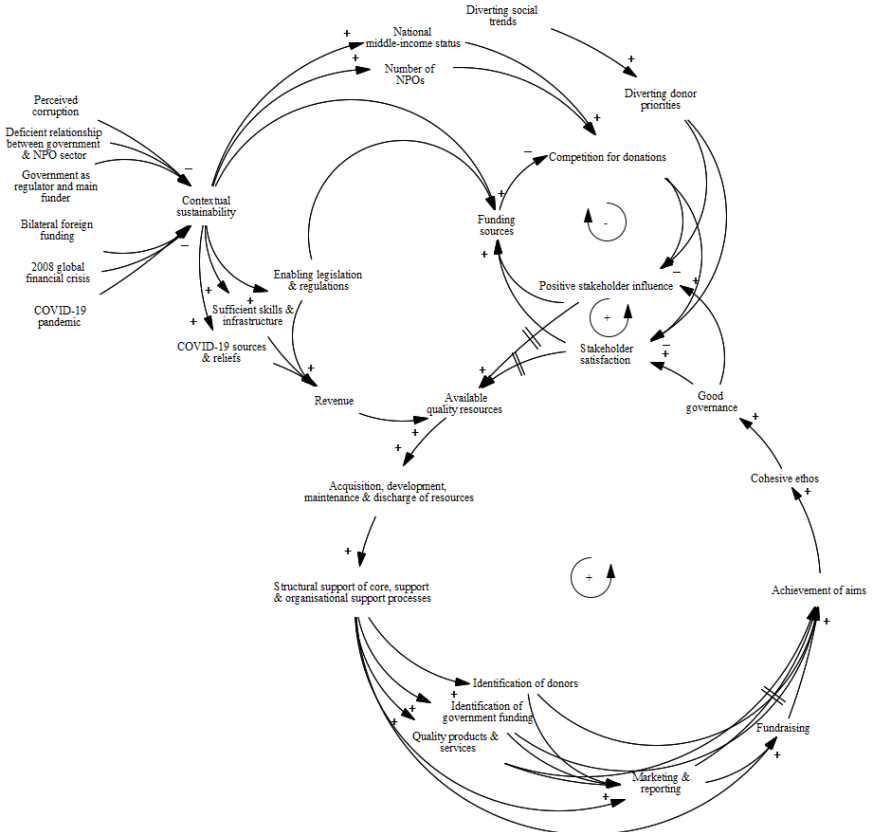
Results


Organisational capacity
Contextual sustainability
Positive stakeholder influence
Stakeholder satisfaction
Available quality resources
Good governance
Structural support of core, support & organisational support processes
Cohesive ethos
Processes identidying needs, develop & deliver products & services
Achievement of aims

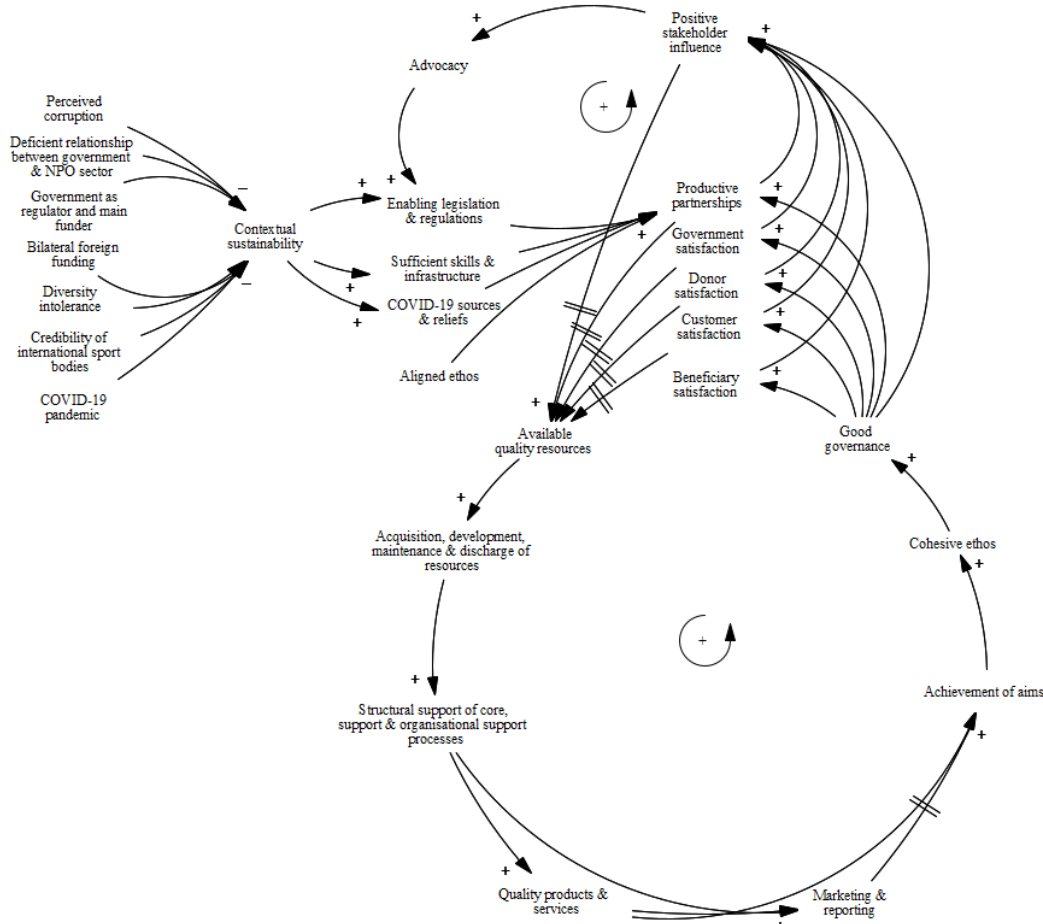

Human resources
Contextual sustainability
Positive stakeholder influence
Stakeholder satisfaction
Available quality reources
Good governance
Acquisition, development, maintenance & discharge of resources
Cohesive ethos
Resource allocation & training
Recognition
Achievement of aims
Fundraising
Retention
Attractiveness of organisation
Marketing & reporting
Qualified employees
Aligned ethos
Employee commitment
Quality products & services
Structural support of core, support & organisational support processes

Results

Financial viability

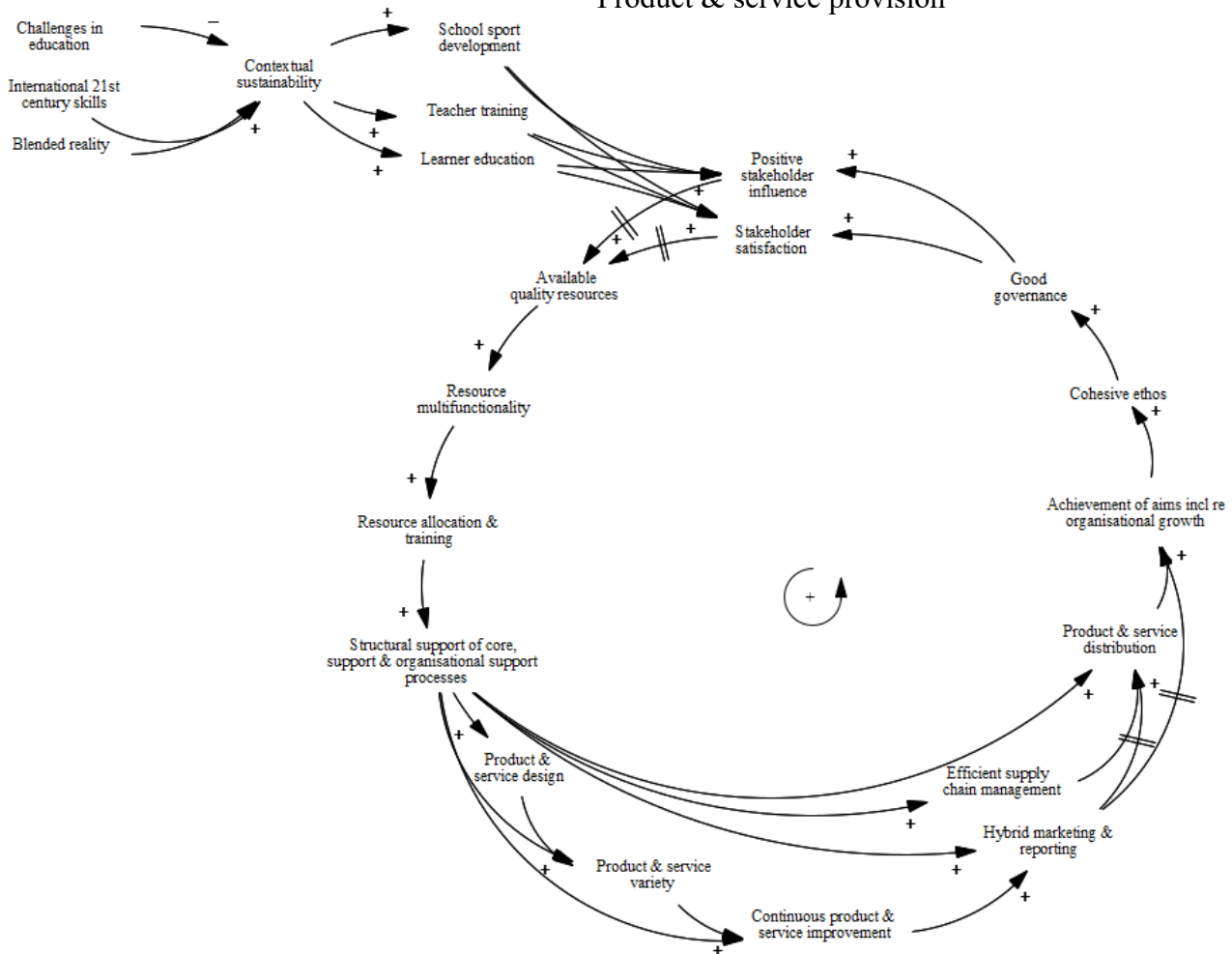


Stakeholder relations



Results

Product & service provision

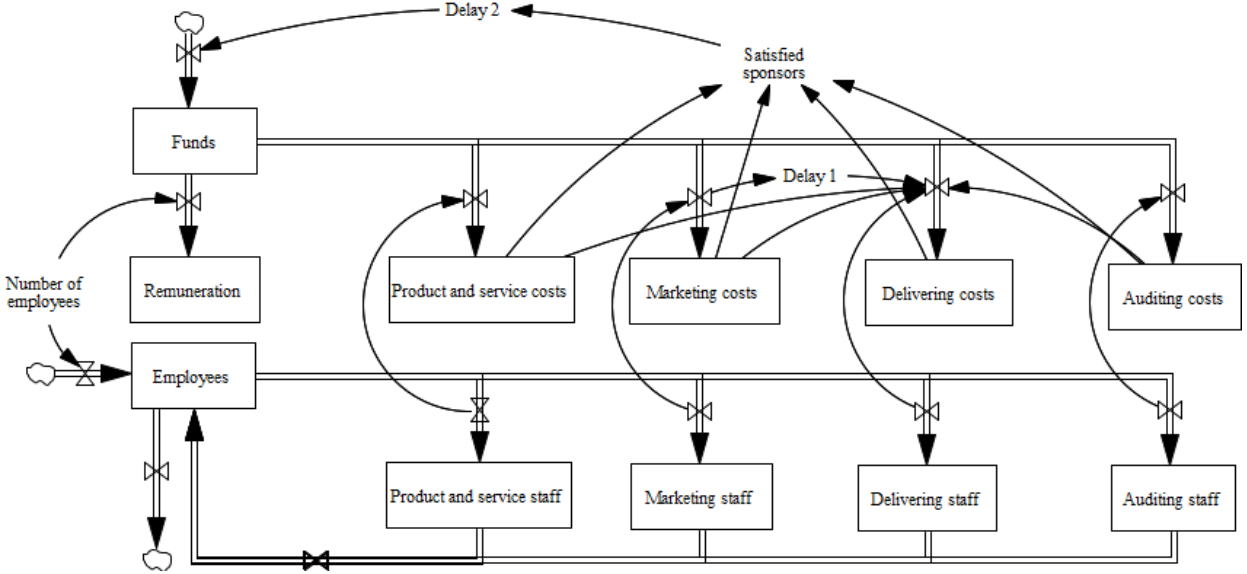


Simplifying assumptions

- Contextual sustainability excluded
- Available quality resources include only employees and funds
- Training and structural support assumed
- Efficient supply chain management modelled through model structure

Results

Product & service provision



Quantitative model

$$\ln A_t = b_0 - 0.48 \ln B_{t-1} + 0.53 \ln D_{t-1} - 0.01 \ln E_{t-1} - 0.05 \ln F_{t-1} - 0.13 \ln G_t + 0.33 \ln I_t + u_t$$

where all variables ≥ 0:

A_t = Donations for year t

B_t = Price of giving for year t = $\frac{\sum_t costs}{\sum_t programme\ costs}$

$C_t = \frac{\sum_t administrative\ costs}{\sum_t costs}$

D_t = Fundraising costs for year t

E_t = Government support for year t

F_t = Program service revenue for year t

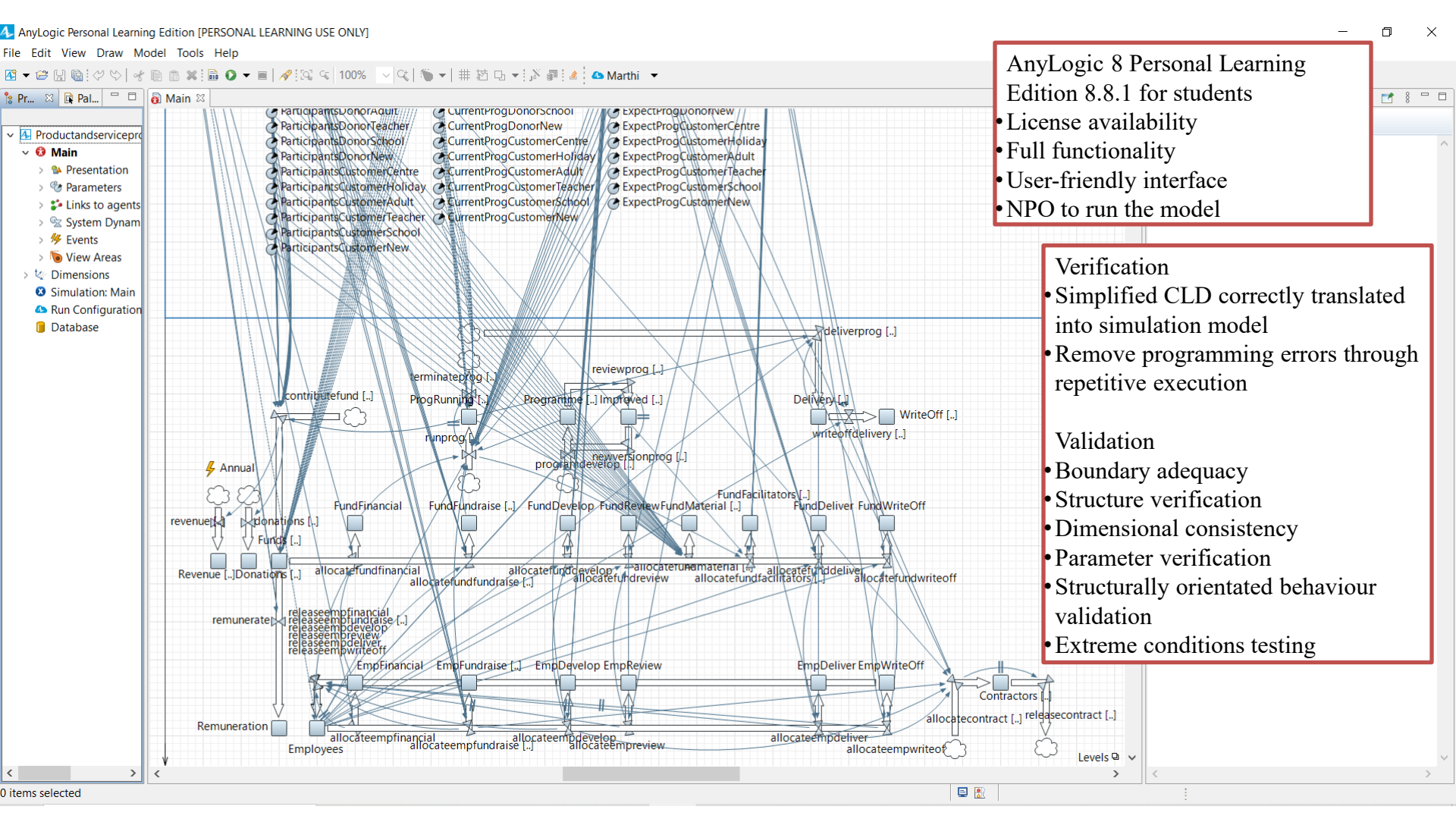
G_t = Years since first filing a tax return at the beginning of year t

H_t = Wealth at the beginning of year t = $\frac{\sum_t(FA+CA)-\sum_t(LTL+CL+restricted\ assets)}{\sum_{t-1}(costs-fundraising\ costs)}$

I_t = Total assets at the beginning of year t

$b_0 = \ln\left(\sum_i P(donor\ supports\ project\ i) \times project\ i\ cost \times markup\right)$

u_t = Error term



AnyLogic 8 Personal Learning Edition 8.8.1 for students

- License availability
- Full functionality
- User-friendly interface
- NPO to run the model

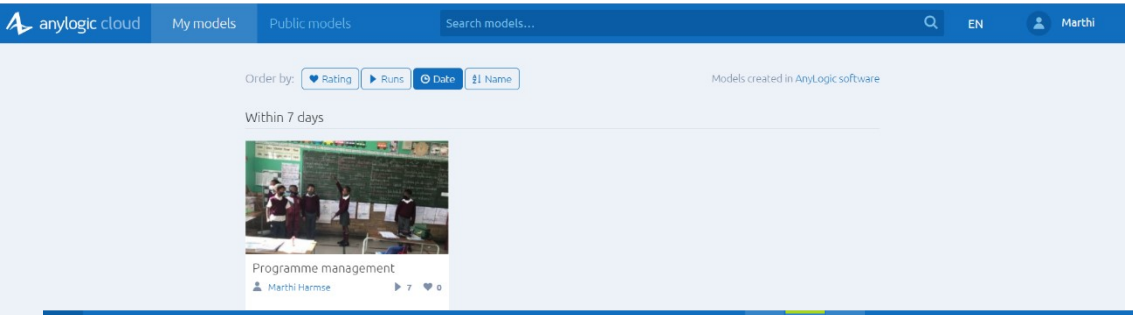
Verification

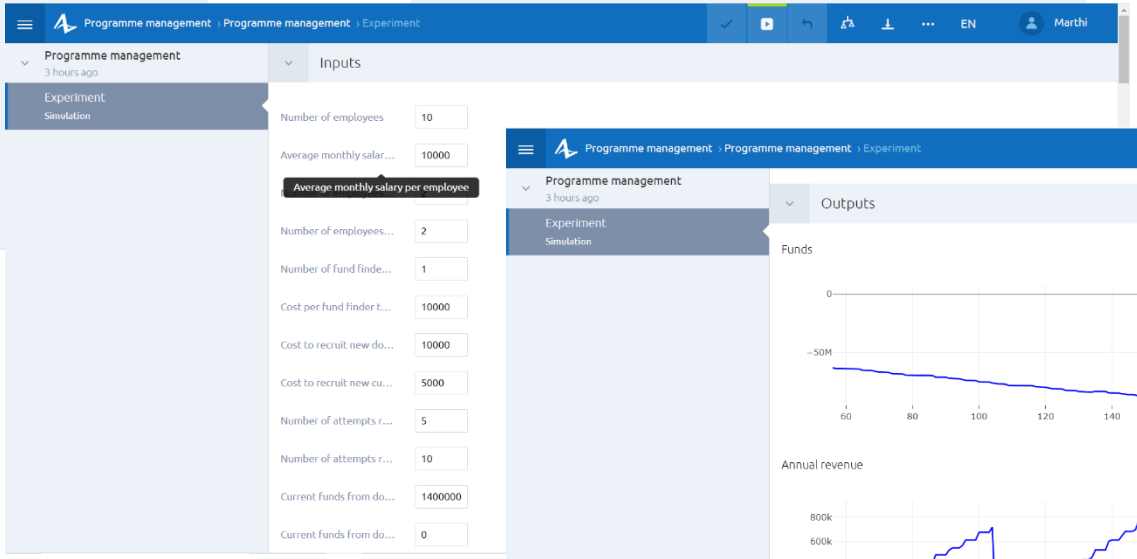
- Simplified CLD correctly translated into simulation model
- Remove programming errors through repetitive execution

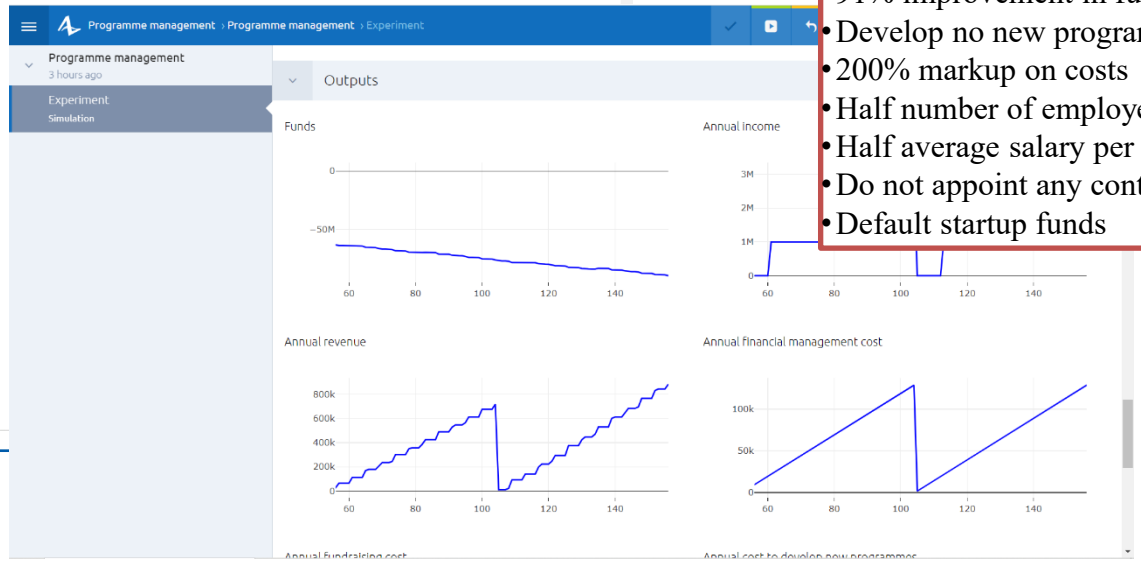
Validation

- Boundary adequacy
- Structure verification
- Dimensional consistency
- Parameter verification
- Structurally orientated behaviour validation
- Extreme conditions testing

Results







Leverage points
- Development of new programmes
- Markup on costs
- Number of employees
- Average salary per employee
- Appointment of contractors
- Startup funds

Base case
- NPO runs out of funds after 4 weeks
- Dept > R150M after 3 years

91% improvement in funds over 3 years
- Develop no new programmes
- 200% markup on costs
- Half number of employees
- Half average salary per employee
- Do not appoint any contractors
- Default startup funds

Discussion

- Reinforcing feedback loops
- Process perspective
- Adaptation to contextual environment
- Simultaneous balancing feedback loops in opposite direction
- High-level view of an issue
- Identification of leverage points, sensemaking of forces at play, decision making

Conclusion

Tackling a complex problem through a systems approach

- Process to develop theory on NPO situation through SD
- CLDs of NPO organisational capacity, human resources, financial viability, stakeholder relations, and product and service provision
- Quantitative simulation model of NPO product and service provision