Fynbos for the Future

Final Presentation of Evaluation Results

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The research for this report was conducted as a Masters Dissertation based on a request for such research by Greenpop. This summary report focusses on the method and findings of the study with a brief introduction.

The UCT Knowledge Co-op facilitated this collaborative project between Greenpop and UCT.

Firstly…

Thank you to everyone who made this possible

Main Research Aim:

To explore the influence of “Fynbos for the Future” Environmental Education (EE) programme on learner’s knowledge, attitudes and behaviours towards the environment.

School Exploration

School	Cypress	Mountain Road	Strandfontein
Quintile (socioeconomic indicators)	4	5	5
Language of Instruction	Part English, part Afrikaans	English	English
Soil types	Acid sands and calcareous sands	Granite and shale derived clay	Calcareous sands
Original ecosystems	Strandveld (coastal dune sand) and Sand Fynbos (low pH, poor in nutrients)	Renosterveld (rich clay soil)	Strandveld (coastal dune sand)
Accessibility (to garden)	All the time	Only with supervision	Only during specific times
Image of garden			

- School Quintile Definitions:
- The ranking of schools in South Africa falls into 5 quintiles (quintile 1 = poorest schools, quintile 5 = least poor schools).
- HOWEVER…
- Van Dyk and White (2019) state that schools in quintiles 2-4 may need just as many resources as quintile 1 and are being misidentified into higher quintiles. The schools in quintile 4 are equal to or only slightly above the national average in terms of the proportion of disadvantaged families, but still receive much less funding than quintiles 1-3

Scales Used

Learner Data

Teacher Data

Measure	Type of data collected	Outcome/process
Connectedness to Nature Index (CNI)	Quantitative	Outcome
School Psychological Impact Scale (SPIS)	Quantitative	Outcome
School Environment Survey	Quantitative	Outcome
Learner questionnaire	Qualitative	Process and outcome
Teacher survey	Quantitative	Process and outcome
Teacher interview	Qualitative	Process and outcome

Connectedness to Nature Index (CNI)

This scale measures children's attitudes towards the environment and their general connection to nature.

4 subscales: enjoyment, empathy, oneness, responsibility

- Mean scores of control group generally higher than participant group
- T-test results:
  - Mean scores of control group generally higher than participant group (not significant)
  - However, MRP showed that control group scored better than participant group at a significant level ($p = .032$).
  - Mean scores on subscales also not significant overall)
  - Final t-test was performed on all 4 subscales per school (results on next slide)

Descriptive stats

School	Subscale	Control/Participant	Mean	Standard Deviation
Mountain Road Primary	Enjoyment	Control	4.45	0.39
		Participant	4.01	0.60
	Empathy	Control	4.50	0.65
		Participant	4.40	0.52
	Oneness	Control	4.70	0.38
		Participant	4.38	0.42
	Responsibility	Control	4.65	0.39
		Participant	4.15	0.82
Cypress Primary	Enjoyment	Control	4.20	0.47
		Participant	3.85	0.43
	Empathy	Control	4.40	0.44
		Participant	4.15	0.68
	Oneness	Control	4.31	0.51
		Participant	4.09	0.86
	Responsibility	Control	4.29	0.69
		Participant	4.09	0.64
Strandfontein Primary	Enjoyment	Control	3.95	0.91
		Participant	4.57	0.36
	Empathy	Control	4.20	0.70
		Participant	4.75	0.27
	Oneness	Control	4.19	1.03
		Participant	4.72	0.44
	Responsibility	Control	4.05	0.98
		Participant	4.56	0.69

T-test on subscales per school

Performed to compare the difference between participant and control groups on each scale, at each school

* = significant result

School	Subscale	Mean Difference	BCa 95% Confidence Interval	
			Lower	Upper
Mountain Road Primary	Enjoyment	0.44*	0.11	0.80
	Empathy	0.10	-.26	0.47
	Oneness	0.32*	0.00	0.60
	Responsibility	0.50*	0.09	0.94
Cypress Primary	Enjoyment	0.34*	0.03	0.63
	Empathy	0.24	-0.10	0.59
	Oneness	0.23	-0.16	0.65
	Responsibility	0.21	-0.23	0.62
Strandfontein Primary	Enjoyment	-0.62	-1.29	-0.10
	Empathy	-0.55*	-1.02	-0.11
	Oneness	-0.53	-1.23	0.11
	Responsibility	-0.51	-1.22	0.23

ANOVA test between participants per school

- There was a significant effect of school site on participant scores
    - This different lies between Cypress and Strandfontein

School Psychological Impact Scale (SPIS)

Pre-Post Testing

- Analyses broken into sections:
  - Contact with nature
  - Biophilia
  - Biophobia
  - Environmental stewardship (behavioural manifestations of biophilia)

- Biophilia and Biophobia further assessed in terms of 3 manifestations:
  - Behavioural (actions)
  - Cognitive (thoughts/beliefs)
  - Affective (feelings)

Contact with Nature

- Repeated measures t-test was run to see if there was a significant change in learners' mean contact with nature at baseline and post-test
- On average, baseline showed more interaction with nature than post-test

However, post-test measurement was taken during the programme (not at final completion).

Children may not have maintained contact with nature on their own.

Biophilia, Biophobia and Environmental Stewardship

Tests showed negative results (however, these results were not significant ($p > 0.05$)

School Environment Survey (SES)

Given to learners who did not participate in the programme.
Used to understand their feelings about the garden and how they feel it has impacted them and the school environment

Overall, there were high mean scores, indicating a general agreement with **positive feelings towards nature.**
Most of the students indicate that the **garden has a positive influence** on them and the school environment as a whole

Various codes emerged from the responses which were grouped into themes using thematic analysis:

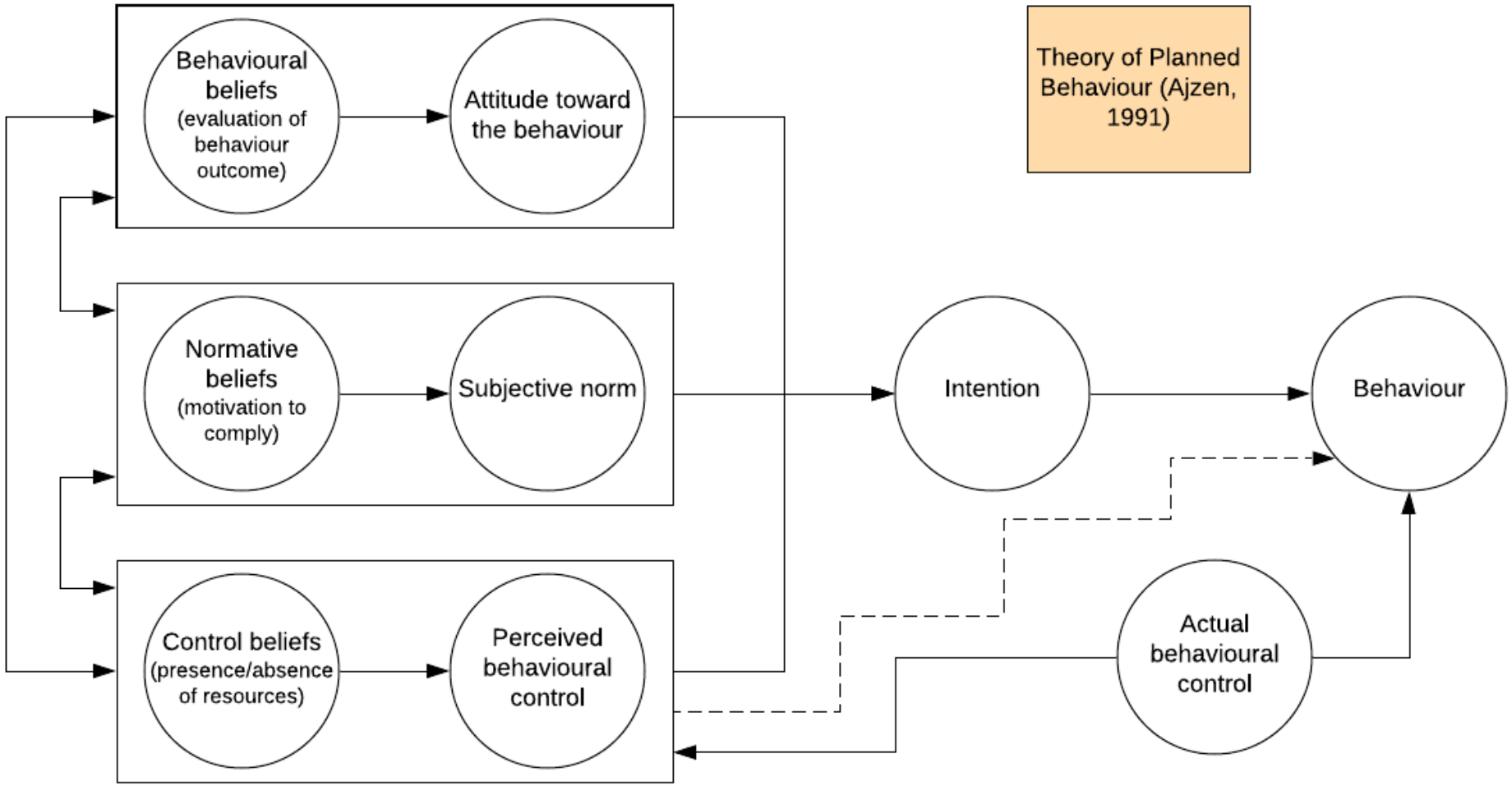
Individual Themes
- Positive feelings
- Environmental responsibility
- More time spent in nature

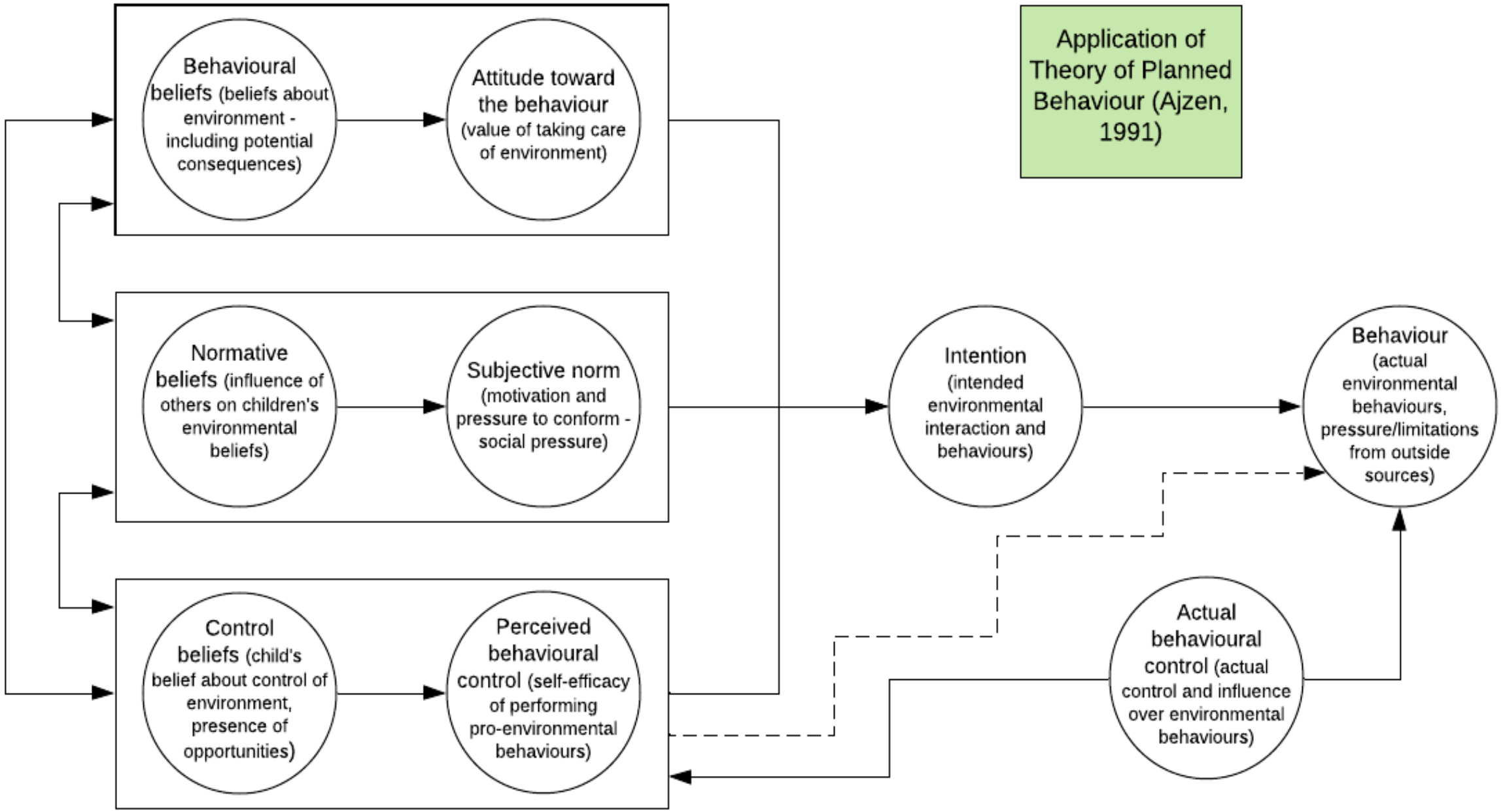
School Environment Themes
- Physical space to enjoy
- Increased awareness (litter, clean environment)

Learner Questionnaire (LQ)

- Qualitative analysis showed positive results.
- Content approach used to understand descriptive statistics
- Thematic Analysis used for in-depth analysis
  - Inductive analysis to specify codes and themes within data itself
  - Deductive analysis completed using Ajzen's (1991) Theory of Planned Behaviour (TPB) as a framework

Theory of Planned Behaviour (Ajzen, 1991)




Application of Theory of Planned Behaviour (Ajzen, 1991)
Behavioural beliefs (beliefs about environment - including potential consequences)
Attitude toward the behaviour (value of taking care of environment)
Normative beliefs (influence of others on children's environmental beliefs)
Subjective norm (motivation and pressure to conform - social pressure)
Control beliefs (child's belief about control of environment, presence of opportunities)
Perceived behavioural control (self-efficacy of performing pro-environmental behaviours)
Intention (intended environmental interaction and behaviours)
Behaviour (actual environmental behaviours, pressure/limitations from outside sources)
Actual behavioural control (actual control and influence over environmental behaviours)

Themes

Found in initial qualitative analysis	Based on Theory of Planned Behaviour (Ajzen, 1985; 1991)
(Positive) environmental attitude – mostly positive	Attitudes (love for environment, etc.)
Environmental interaction - Personal interaction - Sense of community/group interaction	Subjective norms (school environment, family, friends) (What children's interactions with the environment is like)
Environmental stewardship - Awareness - Action	Motivation and past experience with environment (related to "perceived behavioural control" in Theory of Planned Behaviour) (How much past experience and current motivation related to PBC)
Environmental stewardship (awareness)	Knowledge and awareness (pick up trash, etc.)
Environmental stewardship (action)	Intention (wanting others to change, spreading word)

= Actual behaviour change

(What they are actually doing, i.e. what pro-environmental behaviours?)

Overall LQ Results

Learner Questionnaires showed:

- Environmental attitude – students responded positively about attitudes, expressing a general love for nature.

- Personal environmental interaction – students love spending time in nature alone when they can.

- Group environmental interaction – strong sense of community surrounding nature is a principal theme, many children spend time in nature with their families.

- Environmental stewardship – according to Ajzen (1991) this is influenced by past experiences and anticipated obstacles. Thus, past experience, previous environmental programmes and current resources available (many of which are limited) serve as a proxy for understanding perceived behavioural control.

- Overall awareness about environmental problems increased

- General predominant theme of wanting to save the environment is shown throughout the responses

The next section explores process outcomes

Process outcomes

Environmental education workshops:

- Enjoyed by most students
- Very positive reactions to learning in the environment

Garden perfects

- Students who were garden prefects loved it
- Overall a positive attitude towards them (feelings of usefulness)
- However, the lack of respect for the garden (by other students) makes it hard for them to carry out their responsibilities

Teacher Data

	Mean	Std. Deviation
Use of resources by teachers	1.80	0.84
Use of garden by teachers	2.67	0.61
Student interaction with the garden	1.86	0.25
Student attitudes towards the environment	3.83	0.75
Student environmental actions	3.5	0.84

Overall responses relating to programme delivery were positive or neutral. Teachers had very encouraging attitudes towards the implementation of the programme, environmental workshops and the garden design.

However, teachers weren't provided with resources (posters, worksheets, etc.) to integrate into their learning. Teacher buy in was generally low.

Qualitative Results = 

Quantitative Results = 

HOWEVER …. there are various aspects to consider:

- Small sample groups
- Full pre-post test was not possible (no baseline data for control group)
- Same school attendance (confounding variables)
- Lack of standardization of tests
- Schools didn’t keep in-depth registers
- Coronavirus pandemic meant final qualitative data collection was not possible (as schools were closed during this phase)

Recommendations

- Assessing learner's baseline knowledge of the environment (help with curriculum development)
- Student home language (offer in both English & Afrikaans)
- Increase garden accessibility & frequency of interactions
- Creating activities and conversational topics that may involve parents/guardians
- Facilitating school assemblies
- Reflective sessions with learners & teachers for curriculum development
- Refine current programme activities based on the Theory of Planned Behaviour (Ajzen, 1991)

UCT KNOWLEDGE CO-OP

The UCT Knowledge Co-op facilitated this collaborative project.

See http://www.knowledgeco-op.uct.ac.za or

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