The educational effectiveness of eco-schools

and… trying to making usefull recommendations for practice

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Eco-schools

- Largest environmental education initiative in the world
- Under the international umbrella of the FEE (Denmark)
- Targets formal education
- Aims to bring environmental education into the school
- Whole-school approach
- Coordinated by national (non)governmental operators
- Reaches about
  - => 50 countries
  - => 30.000 schools
  - => 600.000 teachers
  - => 9.000.000 students

Eco-Schools

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Eco-schools

Who here is younger than 30?

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Eco-schools

My own eco-school memory

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Eco-schools in Flanders

Some things I have seen in local schools

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Eco-schools in Flanders

- Flanders = the Flemish speaking community of Belgium (6 million)
- Eco-school is the largest EE project in Flanders
- In Flanders, about 3000 primary schools (80%), and 1000 secondary schools (50%) are involved
- Run by the Flemish Government for more some 20 years

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Eco-schools in Flanders

Eco-schools aim at

Environmental impact

& Educational impact

If reach those impacts

=> they are awarded the green flag

In Flanders

Primary education : 75 / 3000 schools

Secondary education : 40 / 1000 schools

BUT, a lot of schools are on their way

Start >> logo 1 >> logo 2 >> logo 3 >> flag

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Eco-schools in Flanders

Who is involved in the implementation of the program?

Flemish government, Dept. of the Environment
>> Central coordination (5 people, 4FTE)

Provincial governments, Depts. of the Environment
>> Eco-school advisors (20 people, 15 FTE)

Educational bodies
>> Pedagogical advisors

Municipalities
>> Environmental officers

Schools
>> Students, teachers, headmasters, all other staff

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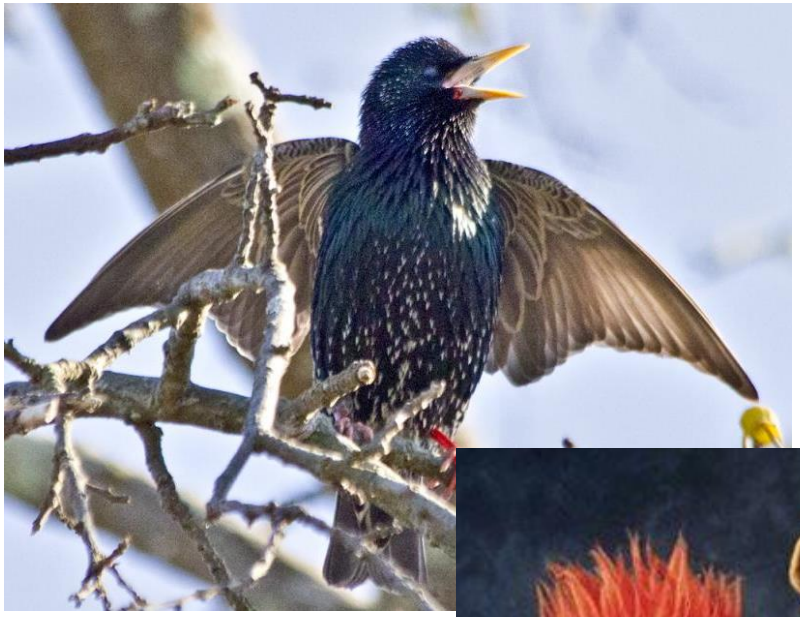
Getting into educational research



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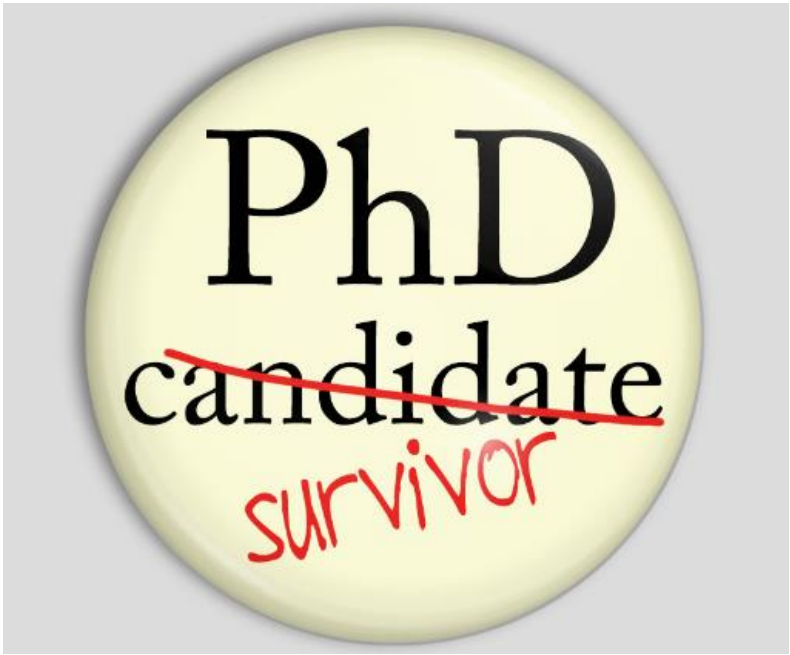

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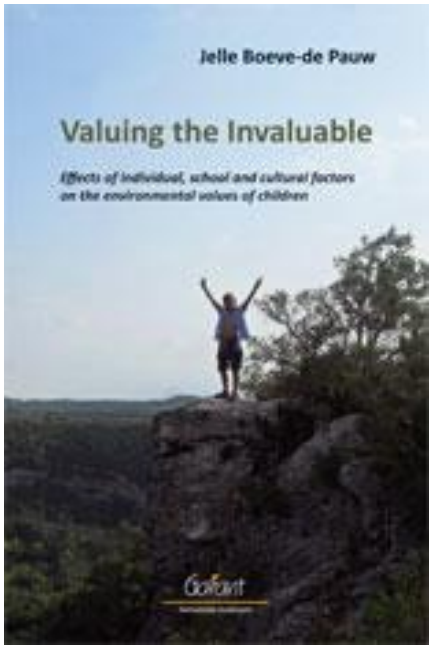
Some results in my PhD

- Formal environmental education rarely succeeds in building the environmental literacy of children
- Schools seem to impact on students' knowledge about the environment while leaving their attitudes, emotions and behaviors unaffected.
- When we try to explain differences in children's environmental literacy, schools are only moderately important
- Eco-schools further build student knowledge but do not contribute to their attitudes and behavior
- Ecoschools (in Flanders) are not effective



Eco-Schools

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Some results in my PhD

A big conclusion was : Ecoschools (in Flanders) are not effective

Recommendations:

>> Eco-schools should be effective

>> Eco-schools should not just impact knowledge

>> Eco-schools should change their approach to education

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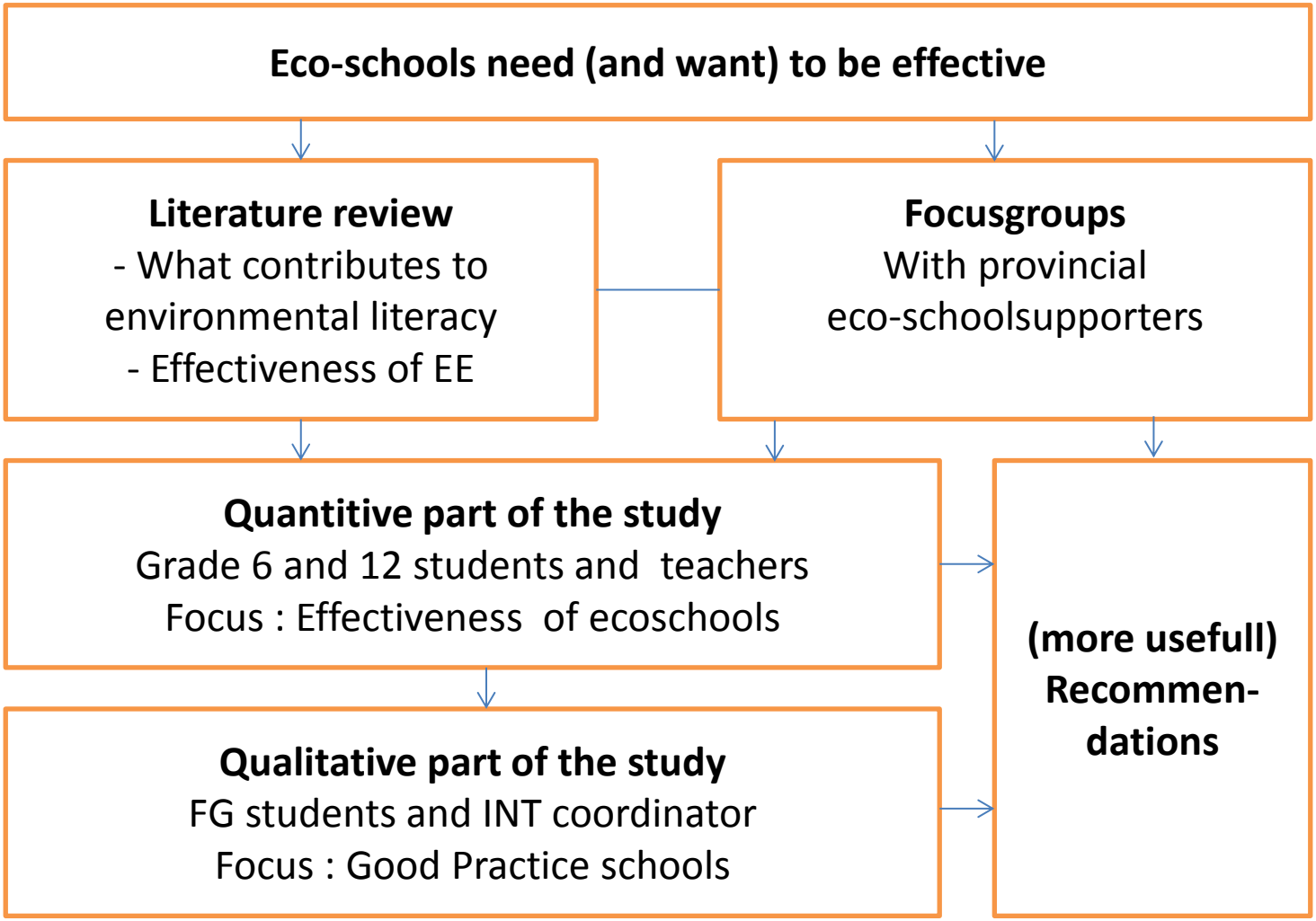
Effects of me making recommendations in my papers

"We want to develop our program and become more effective. Let's join forces and do more research."

The “ecoschool effectiveness study”



What do we know about eco-school effectiveness around the world?

Environmental impact is clear (e.g. Hens et al., 2013)

Eco-schools produce less trash, use less energy, show higher biodiversity, etc.

Educational impact is not so clear

- *Sweden* : No effects or even negative effect (Berglund et al, 2014; Olsson et al 2015)
- *Canada* : No effects on students and their parents (Legault & Pelletier, 2000)
- *Flanders* : Knowledge goes up, attitudes and behaviors are left unaffected (Boeve-de Pauw & Van Petegem, 2011, 2013)
- Similar results in *Czech Republic* (Cincera & Makova, 2013) *Slovenia* (Krnel & Naglic, 2009), *Turkey* (Ozsoy, 2012), *Iceland* (Hallfredsdottir, 2011), *Israel* (Shay-Margalit & Rubin, 2017) and counting…

What do we know about eco-school effectiveness around the world?

Some thoughts on these studies

- all cross-sectional by design
- focus on outcomes
- compare schools in & out the programme
- often no focus on the processes that lead to these outcomes (Cincera & Mankova, 2013; Boeve-de Pauw, 2015).

We can learn much from studying the right outcomes together with process factors. e.g.

- Student participiation in decision making
- Pedagogical approaches
- Schools' EE culture
- Use of natural elements
- Opportunities for students to experience agency (Uitto et al 2015)
- …

Sample

Schools*	Grade 6	Grade 12	Total
Control	11	9	20
Logo 1	12	10	22
Logo 2	11	9	20
Logo 3	13	9	22
Green Flag	9	8	17
Total	56	44	**101**

* Active schools

Respondents	Grade 6	Grade 12	Total
Students	1201	951	2152
Alumni (5 years)	/	232	232
Teachers	511	863	1374
Total	1712	2046	**3758**

Outcomes

Educational profit is… diverse and difficult to describe

"Knowlegde, attitudes, skills, a sensitivity for the subject, critical reflection and thinking, social skliss, schools that develop a new outlook on education, new teaching methods, better policy making capacities" (Vourla, eco-school advisor)

Outcomes

Environmental knowlegde (Roczen, Kaiser, & Bogner, 2012)

Theoretical knowledge

e.g. Why is acidic rain bad for trees?

Applied knowledge

e.g. To use less energy for heating you can …

Motivation Towards the Environment Scale (Pelletier et al., 1998; Boeve-de Pauw & Van Petegem, 2017)

- Building on the Self Determination Theory (Deci & Ryan, 1985)
- Motivation for a behavior as a continuum between self-determined (autonomous) and non-self determined (controlled)

Outcomes

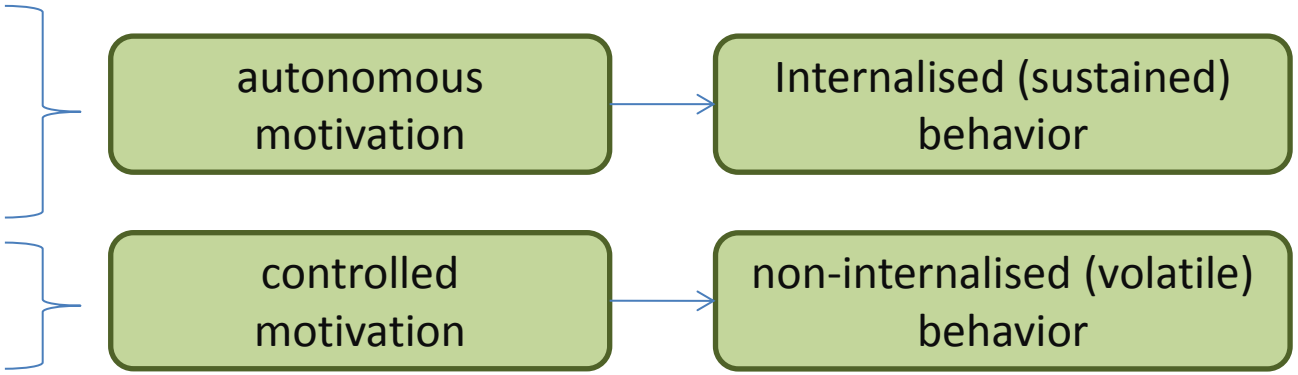
Motivation Towards the Environment Scale

MTES subscale	Items	α	sample item
Intrinsic	4	.69	Because I like the feeling I get from doing so
Integrated	4	.67	Because it is a part of the way I have chosen to live my life
Identified	4	.76	Because I think it is a good idea to do so
Introjected	4	.73	Because I would feel guilty otherwise
External regulation	4	.69	Because my teacher insist that I do so
Amotivation	4	.82	I do not see how my actions can mean anything for the environment

Outcomes

Motivation Towards the Environment Scale

MTES subscale
Intrinsic
Integrated
Identified
Introjected
External regulation
Amotivation



=> what kind(s) of motivation do ecoschools instill in their students and teachers?

* (Cooke & Fielding, 2003)

Outcomes

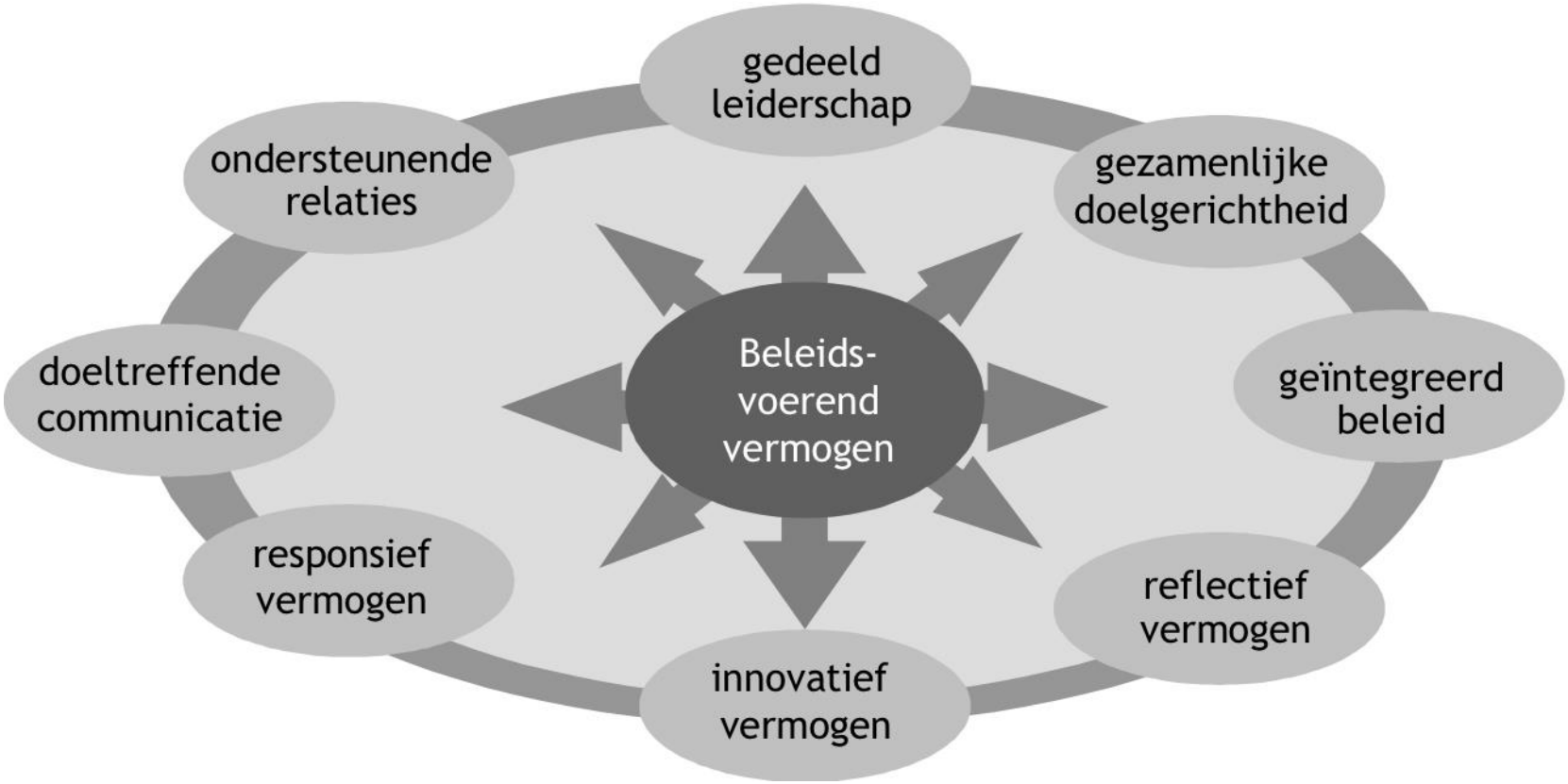
Also in the study, but not in this presentation

Environmental Values (Bogner & Wiseman, 2010)
Connectedness to Nature (Franz & Mayer, 2006)
Inclusion of Nature in the Self (Schultz, 2011)
Environmental Behavior (Kaiser, 2009)

Process variables

Policy making capacities of the school (teachers' responses; CFA)

(Van Petegem et al., 2006)



Process variables

Policy making capacities of the school (teachers' responses; CFA)

(Van Petegem et al., 2006)

Variable	Items	α	sample item, *"in my school"*
Shared leadership	6	.82	everyone is stimulated to take part in decission making regarding environmental education
Common goals	6	.83	consensus exists about what which goals we want to achieve through environmental education
Supportive relations	6	.87	we can rely on each other when it comes to dealing with environmental education

Process variables

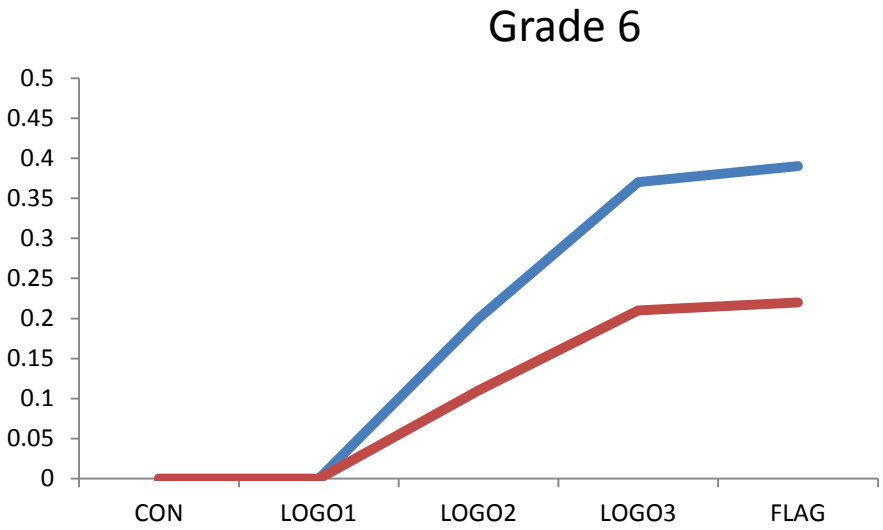
Didactics : drawn from a pool of 20 common teaching methods in Flanders (student data, EFA) (Kavadias & Dehertogh, 2010)

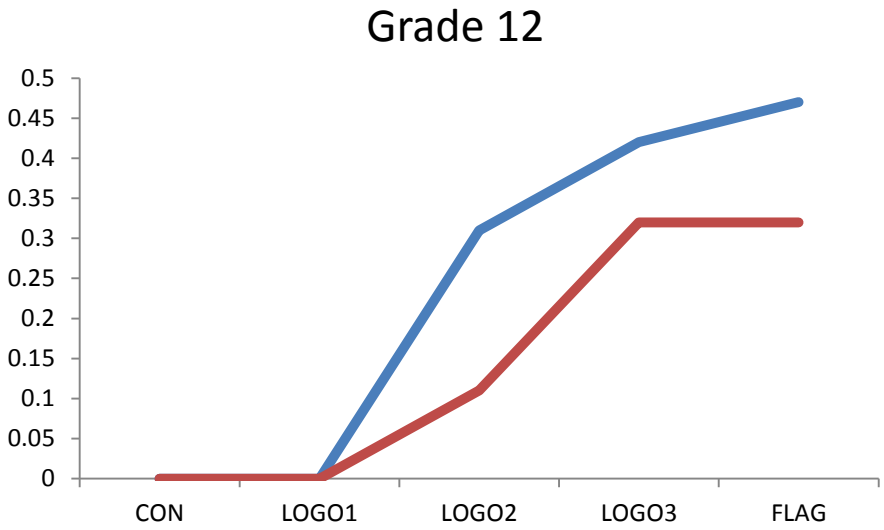
Variable	Items	α	sample item
Rules based	5	.68	visual presence (posters with rules), clear rules and regulations in the agenda, mostly short projects (hours, day)…
Integrated	7	.81	debates & guest speakers, crosscurricular attention, active group assignments yearlong projects…

Analyses

- Factor analyses to assess validity and reliability of all constructs
- Standardized factorscores for each construct
- Hierarchical linear models (multilevel regression) to test effects of eco-schools and of process variables on educational outcomes, while controlling for background variables
    - >> Step 1 : effects of ecoschools on student outcomes
    - >> Step 2 : effects of process variables on student outcomes

Results : student outcomes – environmental knowledge





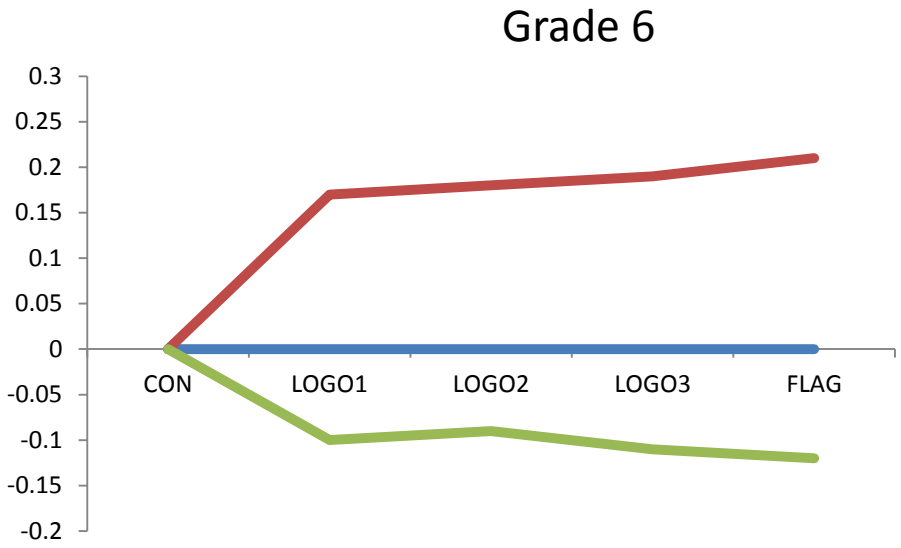
Theoretical knowledge

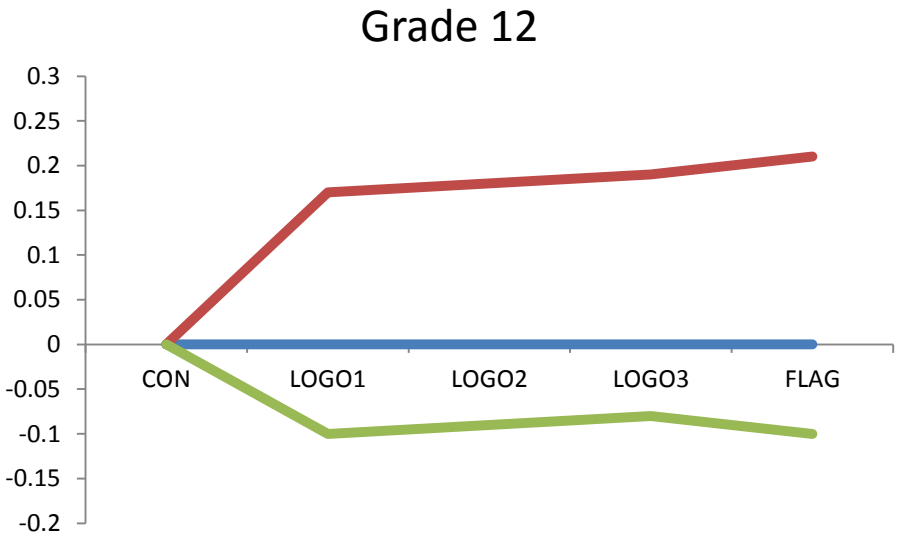
Applied knowledge

Shown in the figures :

Effect sizes of Logo VS Con (β in the HLM)

Results : student outcomes – motivation towards the environment





Shown in the figures :

Effect sizes of Logo VS Con (β in the HLM)

Autonomous motivation

Controlled motivation

Amotivation

Results : summary of outcomes

Outcomes	Grade 6		Grade 12		
	Students	Teachers	Students	Teachers	Alumni
Theoretical knowledge	+++	+	++	+	+
Applied knowledge	++	+	+	ns	+
Autonomous motivation	ns	ns	ns	ns	ns
Controlled motivation	++	+	++	++	+
Amotivation	-	ns	-	ns	-

⇒ At this stage we have only looked at outcomes

⇒ Lets bring some process factor into the picture

Results : effects of process variables on motivation

		AUTO	CON	AMO	
School EE policy making	Shared leadership	+	- -	ns	Teachers
	Common goals	+	- -	ns	
	Supportive relations	+	- -	ns	
Didactics	Rules-based	ns	++	+	Students
	Integrated	+	- -	-	

⇒ However, we observe no significant differences between eco-schools and control schools, concerning the process variables

⇒ The program is (in Flanders) not impacting on the process facilitators of autonomous motivation.

Qualitative results

Selected 4 eco-schools in which we observed the highest scores on a composite 'good practice variable' :

"Preservation values + Autonomous motivation + Connectedness to nature"

Ranking	Primary	Secondary
School 1		v
School 2	v	v
School 3	v	

Qualitative data	School	Semi-structered interview with eco-schools coordinator	Focusgroup discussion wit # students
Primary	School 2	1	4
	School 3	1	6
Secondary	School 1	1	4
	School 2	1	6

Qualitative results

Focus of the qualitative part with GP schools

- The concept of educational outcomes (as a validation). Did we miss elements in the quantitative part of the study?
- Is what is learned through eco-schools transfered to other contexts?
- Student participation : to what extent are students in the GP schools involved in the implementation of the eco-schools program? Are they a source of information, do they provide advice, can they make decissions?

Qualitative results

Focus of the qualitative part with GP schools

- What are, in the perception of the respondents, the factors that facilitate their success as a GP schools?
- How do they experience the advise the eco-school advisors provide? Do they have any expectations of how this could be different/better?
- Which projects are typical for how they implement the eco-schools programme in their school?

Qualitative results

Some findings: in these GP schools

- Student participation is crucial
  (more so in secondary than primary)

"Are there really schools where teachers make these decisions? That just can't work!" (Marlies, 18 years, student and a member of the eco-school team)

"We're allowed to try out anything. Sure, sometimes we're told that it might be better to start with something small, but we're thinking big. That's the only way the students in our school will see that its for real." (Sofie, 17 years, student and a member of the eco school team)

Qualitative results

Some findings: in these GP schools

- Recycling is central, even in the GP schools

  Often it is the thing that comes to mind first when asked what it means to be an eco-school

"Being and eco-school is about picking up litter"(Kenneth, 12 year)

"Its all about knowing which trash goes into which dumpster" (Latifah, 11 year)

Qualitative results

Some findings: in these GP schools

- there is more being learned, and there is transfer

"I am convinced that what I am learning here [in the eco-school team]*, will be usefull when I start working in an entreprise… Like… leading meetings or presenting ideas"* (Zenobi, 18 years, member of the eco-school team)

"I've learned to deal with resistance. Like, how to deal with the adolescents [rolls eyes] *in 9th grade. That helps me with the work I do for the playgrounds* [as a student monitor for the municipality]*"* (Sofie, 17 years, student and a member of the eco-school team)

Conclusions

Outcomes

- Eco-schools build theoretical knowledge rather than applied knowledge
- Eco-schools increase controlled, not autonomous motivation.
- These effects are present in primary and in secondary education, in students and in teachers, and alumni.
- In GP schools some students acquire transferable skills though the project

Process

- Schools' policy making can counter this effect for **teachers**. A collabrative climate positively influences the quality of their motivation towards the environment.
- An integrated didactical approach has a similiar effects on the **students**' motivation towards the environment
- Eco-schools do not report more a collaborative climate nor more integrated didactics.
- Good practice schools involve authentic student participation.

That brings us back to

Based on these results, what would you recommend the eco-schools program ?

>> Focus on the central coordination and school supporters

>> Think about how these recommendations are different from “eco-schools need to change”

That brings us back to

Here are some recommendations that we made

- Support teachers in applying an integrated rather than a rules-based didactical approach. This will foster autonomous motivation for the environment in the students.
- Support schools to create a shared perspectives on goals and approaches of the program. Make sure the ownership is shared by a group within the school. Make this a priority when a new school enters into the program.
- Support schools in creating a participatory climate in which students can experience authentic participation.

That brings us back to

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- **Support schools** in creating a participatory climate in which students can experience authentic participation.

>> shift in the focus towards supporting school teams

Than we had lots of workshops with all kinds of stakeholders

And something amazing happened

After 20 years of running the eco-schools program, the Flemish government has initiated a grand reform : Ecoschools2.0

- No more logos (!)
- Moving towards formative outcomes evaluation rather than portfolios of proof
- **Experts on environmental management**
  >> coaches of schoolteams

>> The same people have to do another job

"Lets collaborate on building the eco-school coaches' competences for their new role"

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Coaching the coaches

- 1,5 year project with the provincial coaches
- Focus on the competences that coaches need for their new role
- Tailored to the needs of specific schools
- Ownership is with the coaches
- Lots of feedback to and from different stakeholders

Finding the right schools to do this

- The selection of schools in which coaches would experiment with their new role was crucial for the project
- We only selected schools that had a real question for support
- They needed to be as divers as possible
- Eco-school coaches were heavily involved in determining the criteria for selecting schools

Finding the right schools to do this

Longlist : 40 schools

>> Each coach provided a list of schools

- where the project is 'alive'
- that would we a interesting case, according to the coaches

Shortlist : 12 schools (selected by the researchers)

Final choice of 6 schools (selected by the coaches)

Finding the right schools to do this

									Administrative					Collective of coaches					Effectiveness study				
provincie	school	gemeente	mosbegeleider	LO/SO	Kolom1			potte	Mos-profiel	1 draagvlak	2 betrokkenhe	3 EDO	4 geint aanpak	5 groen hoeve	5 groen dic ge	6 gedeeld leid	7 collegialiteit	8 gezap
WVL	BSGO De Driesprong	Deerlijk	Joke	BaO		officieel		135	3	3	4	3	3	5	3	5	5	5
BHG	De Wimpel	Elsene	Greet	BaO		GO!			1	3	5	1	1	2	2	2	3	3
LIM	VB Jan Rosier	onbekend	Karel of Philippe P	BaO		vrij			4	4	4	3	4	2	2	2	4	3
VBR	Sint Angela	Tildonk	Philippe M	SO	ASO TSO BSO	vrij		758	4	4	2	4	4	5	2	4	4	4
OVL	Villa Da Vinci	Sint-Niklaas	Mike	SO	ASO, Freinet	GO!		< 200 lln?	2,5	2	2	2	2,5	3	2,5	3,5	3,5	?
ANT	Xaveriuscollege	Antwerpen	Elke	BaO		vrij			4,5	4	3,5	3	4	3	3	3	3	3
ANT	Xaveriuscollege	Antwerpen	Veerle	SO	ASO	vrij		669+207	2	4	3,5	3,5	4	3	1	1	1	1

Six schools, six experiments

- 3 primary schools and 3 secondary schools
- Experiments based on the needs of the school
- Results were input for intervision & communities of practices
- Working papers for each experiment

- **Coaches** coached the school teams and reported on that through the working papers
- **Researchers** supported the coaches and reported across the experiments

Some characteristics of what we did and didn't do

NO	YES
Evaluate	Suport and facilitate
Researchers as owners of experiments	Coaches as owners
Researcher support schools	Researchers support coaches, who supporti schools
Provide answers	Look for answers together
One size fits all	Lots of diversity
Directive	Collaborative
Fixed path	Messy path, failure is OK

Example 1: Participation

Example 1: Participation - Focus of the experiment

1. How can we strenghten the participation in schools?
    - Focus on large schools
    - Participation of teachers and students
    - Participation as a instrument, not as a goal
2. Which theoretical frameworks are relevant? Which words do we use to talk to eachother about participation?
3. Which tools can help us achieve participation?
4. Can we ‘measure’ the degree of participation in a school?

>> What is our role as eco-school coaches in all of this, and which competences do we need (to develop)?

Example 2: Intakes

Example 2: Intakes – Focus of the experiment

1. What are current practices in intakes?
2. Can we match those to eco-schools2.0?
3. Can we design an intake instrument that is robust but flexible enough to help us coach schools?
4. How we can use the information from the intake throughout the schools' journey in the eco-schools program?

>> What is our role as eco-school coaches in all of this, and which competences do we need (to develop)?

Communities of practice

- We supported coaches to build two CoP
  - **Special education**
  - **Pre-school education**
- Participants: ecoschool coaches, teachers, teacher trainers, school developers, method developers, curriculum writers…
- Learn together, bring theory into practice, and share experiences

FOCUS:
>> What is the role of the eco-school coaches in all of this, and which competences are needed (to develop)?

Intervision

- Participants : coaches in the experiments
- Researcher as intervision facilitator
- *Focus 1* : the competences of the eco-schools 2.0 coach
- *Focus 2* : get to know intervision as an approach to professional development
- *Focus 3* : input for the working papers

That brings us back to : Making recommendations

Level 1 – Supporting schools to become eco-schools
>> create clarity around the mandate coaches have in schools
>> increase the dynamics while supporting schools: higher intensity and more transparant communication
…
Level 2 - Eco-schools Flanders as a learning organisation
>> create a common language to talk about teaching and learning
>> integrate intervision as a means for professional development
…
Level 3 – The organisational structure of Eco-schools Flanders
>> focus on convergence within the team. Facilitate the team mind
>> install clear leadership throught the different governmental levels
…

That brings us back to : Making recommendations

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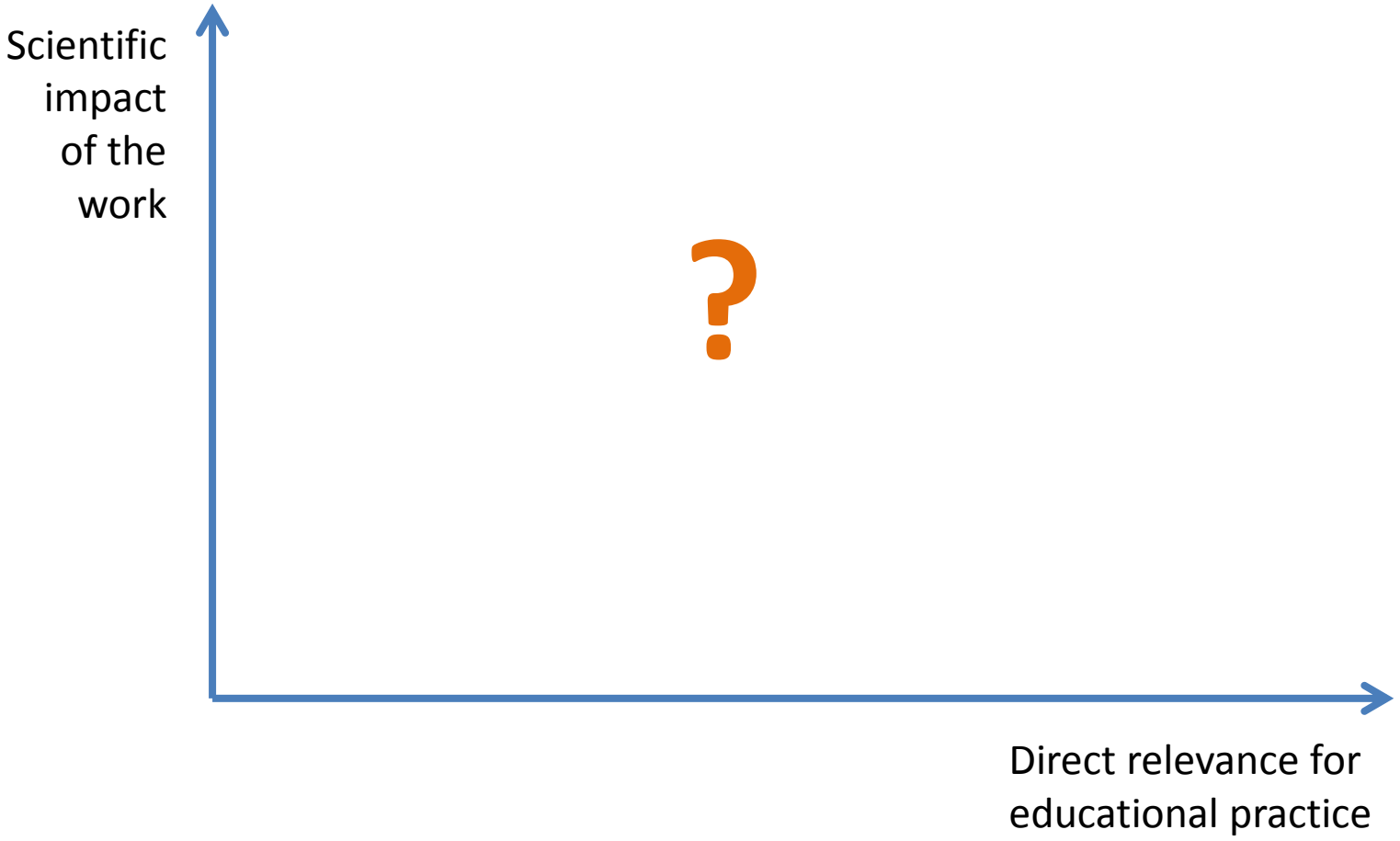
Some time for reflection



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Some time for reflection

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Some time for reflection

What I got out of from trying to make usefull recommendations

- Great connections with practitioners
- Lots and lots of work
- Diversity in what I'm doing and who I'm working with
- Head aches
- Some strange looks from colleagues down the hall
- Less time for writing peer reviewed publications
- Stress about less time for publishing
- An increased sense of purpouse
- New ideas for research
- A huge new national longitudinal research and development project

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Some time for reflection

What did you get out of the past hour?