

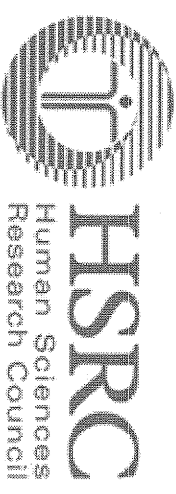
The Plus Time project: Extra classes, extra marks?

CH Prinsloo (with M vd Berg, L Maart & G Diedericks)
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Social science that makes a difference

HSRC RESEARCH OUTPUTS
5081



Programme

- Introduction: (of & by) participants of the day
- Objectives for the day
- Origin of the project (Ms L Maart)
- Research problem & objectives
- Tuition programme and tutors (Mr Milton van der Berg, Metro-South EMDC of WCED)
- Study design & methodology (Dr Cas Prinsloo, HSRC)
- Findings:
 - Baseline – context and learner performance
 - Tuition contents and attendance levels
 - Post-project learner performance
 - Difference-in-difference analysis
 - Role of contextual factors
- Discussion, implications and towards recommendations

Objectives for the day

- Share project background
- Share methodology and findings
- Verify the contents of what we thought we observed and found
- Share our preliminary notions of the implications of the study
- Hone our sense of recommendations
- Receive advice on further dissemination

Purpose of the study

- Research problem: learner performance in crisis (Mathematics, English ← numeracy, literacy)
- Demo or pilot test a possible intervention / solution
- How? When? Learning areas? Practicality? Affordability? Sustainability?
- Helping learners recover basic competencies
- Exploring content of and approach to workable tuition programme delivery
- Understanding the limits/interactions of interventions within context
- Controlling some conditions (to increase the chance of finding true and realistic answers)

Trade-offs and balances

- Expensive – inconclusive (pilot/demo)
- Super roll-out – realistic effort (tuition)
- Sophistication & value – practical implementation (intervention)
- Possibility – affordability (going to scale)
- Reliability – relevance (science & findings)
- Soundness – simplicity (study, report)
- Control – ownership, buy-in and realism (study, implementation)

Method

Design and methodology

- Matched/paired control(-group) design
- Sample (institutional): convenient, but “typical” representation; selected/volunteered; single EMDC; 4 control 4 experimental schools
- Sample (learners): voluntary
- Pre- and post-tests as criterion measures
- Contextual background (various instruments)
- Difference-in-difference analysis
- Contextual or contributing factors/interactions

Schematic view (simplified)

Group

Pre-tests

Interv.

Post-test 1 -Time-

Post-test 2

Control (C)	O_c		O_{1c}		O_{2c}
Project (X)	O_x	X_1	O_{1x}		O_{2x}

Schematic view (illustration)

Learner performance testing schedule / design

Baseline	Intervention	Post in 2007	Diff 1	Post 1 2008	Diff 2	Post 2 2011	Diff 3
Gr 8 MCQ		Gr 8 MCQ		Gr 9 exit		Matric exit	
E (45)	Yes / yes / y	E (58)	13	E (60)	15	E (55)	10
Same/diff baseline		diff b (+10%pt)		diff b (+10+ %pt)		diff b (+10+ %pt)	
C (42)	No	C (45)	3	C (45)	3	C (37)	Minus 5

Diff-in-diff Scores	(in % points)	10	12	15

Matching / pairing of schools

- Over-sampled potential control schools
- Collected contextual and baseline performance information from 4 experimental & 8 controls
- Made informed, consulted decision (4 pairs)
- Confirmed school, teacher, learner & parent context empirically afterwards (← delay)
- Cut 4 control schools from post-data activity
- Initial performance levels accommodated
- (Replaced one experimental school very late)
- (Teacher strike and recovery plans)

School pairs

- Determined and clustered in terms of:
 - socio-economic feeder-area characteristics, and
 - other opportunity-to-learn factors

Project schools

Ocean View

Fairmount

Vuyiseka

Intsebenziswano

Control schools

Aloe

Steenberg

Phakama

Siyazakha

&

&

&

&

Aloe

Steenberg

Phakama

Siyazakha

Findings

Main findings (Difference-in-difference analyses)

Pair S - Mathematics

Group (n=170)	Pre- (n) %	Diff. in %-pts	Post- (n) %	Atten- dance
Experi- mental (n=92)	(12) 29,6	+0,2	(12) 29,8	Lo
	(29) 30,3	+1,6	(29) 31,9	Hi
	(41) 30,1	+1,1	(41) 31,1	All pairs
Control (n=78)	(71) 28,9	+2,3	(41) 31,2	All
	(29) 23,9	+4,2	(29) 28,1	All pairs
	(55) 24,8	+2,7	(32) 27,5	All

Pair S - English

Group (n=170)	Pre- (n) %	Diff. in %-pts	Post- (n) %	Atten- dance
Experi- mental (n=92)	(20) 31,0	+5,7	(20) 36,7	Lo
	(22) 27,5	+8,7	(22) 36,2	Hi
	(42) 29,1	+7,3	(42) 36,4	All pairs
Control (n=78)	(68) 29,4	+7,0	(42) 36,4	All
	(31) 29,6	+4,6	(31) 34,2	All pairs
	(58) 29,4	+4,3	(34) 33,7	All

Pair M - Mathematics

Group (n=238)	Pre- (n) %	Diff. in %-pts	Post- (n) %	Atten- dance
Experi- mental (n=79)	(12) 32,9	+1,8	(12) 34,7	Lo
	(18) 27,2	+7,7	(18) 34,9	Hi
	(30) 29,5	+5,3	(30) 34,8	All pairs
Control (n=159)	(34) 30,1	+6,6	(34) 36,7	All
	(76) 31,0	+2,0	(76) 33,0	All pairs
	(79) 30,6	+2,4	(77) 33,0	All

Pair M - English

Group (n=238)	Pre- (n) %	Diff. in %-pts	Post- (n) %	Atten- dance
Experi- mental (n=79)	(33) 34,3	+3,4	(33) 37,7	Lo
	(29) 36,4	-1,2	(29) 35,2	Hi
	(62) 35,3	+1,2	(62) 36,5	All pairs
Control (n=159)	(67) 35,0	+1,3	(64) 36,3	All
	(66) 42,5	+1,8	(66) 44,3	All pairs
	(76) 42,4	+1,3	(67) 43,7	All

Pair B - Mathematics

Group (n=178)	Pre- (n) %	Diff. in %-pts	Post- (n) %	Atten- dance
Experi- mental (n=91)	(35) 26,5	+1,7	(35) 28,2	Lo
	(26) 25,5	+3,6	(26) 29,1	Hi
	(61) 26,1	+2,5	(61) 28,6	All pairs
Control (n=87)	(72) 26,7	+1,3	(67) 28,0	All
	(57) 31,3	+11,1	(57) 42,4	All pairs
	(79) 30,7	+11,6	(58) 42,3	All

Pair B - English

Group (n=178)	Pre- (n) %	Diff. in %-pts	Post- (n) %	Atten- dance
Experi- mental (n=91)	(24) 29,8	-1,8	(24) 28,0	Lo
	(20) 33,2	-3,4	(20) 29,8	Hi
	(44) 31,3	-2,5	(44) 28,8	All pairs
Control (n=87)	(63) 30,2	-1,5	(60) 28,7	All
	(25) 39,0	-5,9	(25) 33,1	All pairs
	(77) 39,1	-6,0	(25) 33,1	All

Pair Z - Mathematics

Group (n=188)	Pre- (n) %	Diff. in %-pts	Post- (n) %	Atten- dance
Experi- mental (n=96)	(3) 42,9	-15,1	(3) 27,8	Lo
	(13) 26,6	+3,3	(13) 29,9	Hi
	(16) 29,6	-0,1	(16) 29,5	All pairs
Control (n=92)	(70) 26,2	+1,8	(45) 28,0	All
	(85) 30,6	+0,6	(85) 31,2	All pairs
	(90) 30,6	+0,6	(85) 31,2	All

Pair Z - English

Group (n=188)	Pre- (n) %	Diff. in %-pts	Post- (n) %	Atten- dance
Experi- mental (n=96)	(12) 35,1	-6,3	(12) 28,8	Lo
	(33) 26,4	+5,7	(33) 32,1	Hi
	(45) 28,7	+2,5	(45) 31,2	All pairs
Control (n=92)	(70) 29,2	+2,2	(47) 31,4	All
	(70) 31,1	+1,4	(70) 32,5	All pairs
	(90) 30,8	+1,8	(71) 32,6	All

All - Mathematics

Group	Pre- (n) %	Diff. in %-pts	Post- (n) %	Atten- dance
Experimental (n=358)	(62) 29,1	+0,7	(62) 29,8	Lo
	(86) 27,7	+3,7	(86) 31,4	Hi
	(148) 28,3	+2,4	(148) 30,7	All pairs
Control (n=416)	(247) 27,7	+2,6	(187) 30,3	All
	(247) 30,1	+3,9	(247) 34,0	All pairs
	(303) 29,6	+4,2	(251) 33,8	All

All - English

Group	Pre-	Diff. in	Post-	Atten-
(n=774)	(n) %	%-pts	(n) %	dance
Experi- mental (n=358)	(89) 32,4	+1,2	(89) 33,6	Lo
	(104) 30,7	+2,7	(104) 33,4	Hi
	(193) 31,5	+2,0	(193) 33,5	All pairs
Control (n=416)	(268) 30,9	+2,2	(213) 33,1	All
	(192) 35,9	+1,0	(192) 36,9	All pairs
	(301) 35,6	+0,9	(197) 36,5	All

Additional correlations (LP)

Decimals omitted when not 1	Mpre	Mpst	Mdif	Matt	Epre	Epst	Edif	Eatt
Mpre	1							
Mpst	46**	1						
Mdif	-41**	62**	1					
Matt	02	17*	05	1				
Epre	23**	26**	06	05	1			
Epst	22**	26**	07	-01	51**	1		
Edif	-05	01	04	-03	-47**	52**	1	
Eatt	05	24**	12	74**	-01	-04	02	1

Findings: Frequencies and demographics

Overall test frequencies

(Note 3 layers of analysis)		English		
		Pre-or post	Pre-& post	Row totals
Maths	Pre-or post	213	166	379
	Pre-& post	176	219	395
	Column totals	389	385	774

Test frequencies by group & LA

Group	Phase (sub-)	Maths pre	Maths post	Eng pre	Eng post
Proj.	Test pairs	148	148	193	193
	All tests	247 45=Afr	187 25=Afr	268	213
	Test pairs	247	247	192	192
Contr.	All tests	303 57=Afr	251 49=Afr	301	197

Instruments

- Mathematics - Grade 8 MCQ test (Afr & Eng)
- English - Grade 8 MCQ test
- Learner contextual questionnaire (Afr & Eng)
- Parent contextual questionnaire (3 languages)
- Teacher & tutor contextual questionnaires
- School and principal contextual questionnaire
- Tutorial contents and attendance sheets
- Briefing sessions, detailed administration procedures

Questionnaire frequencies

Item/Lang	Project	Control	Total
LRQ Afr	48	45	93
LRQ Eng	247	216	463
LRQ Total	295	261	556
PRQ Afr	48	49	97
PRQ Eng	49	67	125
PRQ Xh	113	127	240
PRQ Total	210	252	462

Demographics

- Girl students – 57,6% (altruism, ambition)
- Home language – 22% Afrikaans, 26% English, 51% isiXhosa, 1% other
- Age – 13 yrs (1994) 6%, 14 yrs (1993) 60%, 15 yrs (1992) 22%, 16 yrs (1991) 8%, 17-19 yrs (1988-1990) 4%
- “Parent” questionnaires – mothers 70%, fathers 20%, sibs – 6%, family 3%, caregivers 3%
- Parent qualifications – primary school 40-50%, Gr 9 33-40%, of the 20% rest 5-7% post-school

**Findings: Contextual factors and
their influence
(on performance, and
performance improvement)**

Quality control

- Research ethics
 - Information sheet for every participant
 - Consent forms
 - Ethics committee line number
 - Every instrument, form and proposal signed off
- Steering and working committees
 - Metro-South (WCED), TSF (L Maart), HSRC
 - Monthly teleconference, reports, & as required
- Monitoring
 - Site visits

(1a) Learner demographics

- Sex: girl students' Maths and Eng scores improved more than for boys
- Test language (for Maths only): Afrikaans outperformed English
- Home language: isiXhosa learners were outperformed in English by Eng & Afrikaans learners
- isiXhosa learners showed greater Maths improvement (full dataset)

(1b) Learner demographics

- Age: turning 14 in Gr 8 (born in 1993 for the 2007 study) was the optimal age for performance improvement
- 13-year olds did second best, then the 15-year olds
- Outside this, very quick deterioration
- Exception: for black students, they had to be older (with 1 to 2 years) for optimal improvement

(2) Teacher as factor

- In isolated instances Maths improvement was related to who the learners' teacher was
- Same applied, a bit more clearly, for English improvement
- Slight evidence that who the English teacher was, contributed to Maths improvement

(3) Tutor as factor

- Learner performance was seldom unchanged. It rather increased or dropped – suggesting pivotal contribution
- Above the role of tuition contents and quality
- Consistent for English, & almost for Maths
- No difference having internal teachers or external people as tutors
- Undergoing tuition programmes in two learning areas at the same time seemed to be too taxing

(3a) Tuition combinations

- Mathematics (Wiskunde) tuition only, and in Afrikaans
- English tuition only
- Mathematics (Wiskunde) tuition in Afrikaans, and English tuition
- Mathematics tuition (in English), and English tuition
- Mathematics tuition only (in English)

(3b) Tutor-based outcomes

Eng Mth	Decrease in performance		Increase in performance		No chng
	Lo att	Hi att	Lo att	Hi att	
S	<u>9112</u>	<u>9112</u>	<u>121122</u>	<u>121122</u>	9121
		9111	9111 <u>112</u>	<u>112</u> 9121	
M		221	221 222		
		<u>223</u>	<u>223</u> <u>213</u>	<u>213</u>	
B	<u>321322</u>	<u>321323</u>	312	311 313	
	<u>311313</u>				
Z	421 <u>9421</u>	<u>9411</u>		421 9421	
	<u>9411</u>				

(4a) Learner context

No (or very inconsistent or little effect):

- learner access to school
- own bed or bedroom
- proximity or visits to library
- reported assistance from parents (incl. parent reports on frequency of school contact)
- reported levels of time loss in classrooms
- teacher feedback to homework, tests
- parent qualifications (on Maths)

(4b) Learner context

- Reported Grade 7 performance levels in Maths, English and Life Orientation only linked to Maths improvement
- Facilities at home: for Maths, satellite TV appears detrimental, but PCs not
- For English, both appear conducive
- Reading opportunity: for both LAs, esp. with high tuition attendance, the more books (own and others') at home, the higher the improvement

(4c) Learner context

- Reading more newspapers is associated with Maths improvement (with high attendance)
- Reading more magazines is associated with English improvement (with high attendance)
- Time spent on home chores, visiting shops to buy groceries: in various combinations affected Maths and English marks as such, even the improvement scores
- Time spent on homework, even in other subjects, enhanced English performance as such and improvement scores

(4d) Learner context

- Perceived time use and support at school: order and discipline in English classes was related to English performance improvement
- Parent qualifications were related to English performance and score improvement across the experimental and control groups
- Parent reading/literacy behaviours and English improvement was related only in the experimental group
- Parent reading and writing ability was related to Maths improvement only in control group
- Parents' reported support with homework was related to English improvement

(4e) Learner context

- Classroom - frequency of Maths tests and Maths improvement
- Having Maths textbooks for individual use only with tuition led to improved performance
- Also English textbooks - improvement and general performance, irrespective of tuition
- Extra Maths lessons led to Maths improvement (with tuition and proj. group)
- Attending extra Eng lessons was associated with Maths improvement too!

(5) School as factor

- Sample was relatively small
- In one school - both LA s improved above the average
- Such changes could be ascribed to:
 - good management; infrastructure; staff selection, mentoring, ability and commitment?
- Rather than influences from teacher factors, which would kick in in the absence of such anchoring by school

Learner context profile

(could relate some frequencies here from the draft report if there is time)

Acknowledgements

- Learners, parents, teachers, principals of schools
- Tutors / teachers
- EMDC Metro-South officials
- Project manager from Metro-South (Milton van der Berg)
- Provincial officials
- Coordinator / facilitator (Lynette Maart)
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- HSRC colleagues (Gerda Diedericks, Dorethea Herbst, Sharon Flemmit, Dr K Heugh)
- Various stakeholders and academics
- Service providers: Megadigital Printers, Lynfer (Data)



Conclusions

- No single, consistent link: tuition → improve)
 - Except !: Maths high attendance > low attendance
 - Important context/backgrounds have mediated tuition
- These can come in a mix/range of conditions:
- Within learners (ability, motivation, ambition)
 - Outside them, e.g., parent SES and direct support
 - Teacher and tutor ability and motivation
 - School infrastructure
 - In addition to tuition contents as such, &
 - How enacted (attendance, pedagogy, etc.)
 - Not to forget test admin conditions

Implications

- So, it seems as if one has to first evaluate context / conditions, and then customise tuition approach (no thing like one size fits all)
- Keep some standard, though
- In an ideal situation, learners would have enough time, be motivated, have supporting teachers and parents, a decent background (else remediation first), good tutors, and well-structured, coherent and -articulated contents, etc.)

Whereto (go to) from here?

- Discussion
- Reality check
- Build out the implications
- Best formulation of recommendations
- Strategic pointers as to communicating and disseminating recommendations
- Honing the report in the above light
- Update report/findings and submit final client report (towards end of 21 Feb)
- Disseminate through articles & otherwise

Recommendations

- Integrated approach: FP → IP → SP/FET
- Focus also on FP numeracy and literacy
- Twin high schools and feeder schools
- Assist with FP teaching of basics
- Design early remedial (IP) and late remedial (SP) interventions
- Keep intervention as indigenous to schools and teachers as possible (else lots of implications for capacity and funds)
- Guard against inefficient afternoon economy
- Address incentives and remuneration with honesty