

Extra classes, better marks ... also later

Short Supplementary Report on the PlusTime Project

Funded by The Shuttleworth Foundation
For the Western Cape Education Department
Study by the Human Sciences Research Council

July 2009

Prinsloo, CH

Education, Science and Skills Development (ESSD) Research Programme



WESTERN CAPE
Education Department

Provincial Government of the Western Cape



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Abstract (one-page summary version)

The Shuttleworth Foundation, the Western Cape Education Department and the Human Sciences Research Council agreed in 2006 to undertake a joint study during 2007. The study piloted or demonstrated an intervention procedure aimed at increasing teaching time for a group of Grade 8 learners in Mathematics and English to improve their performance in the two learning areas. It was hoped that more would be learned about how one could try and improve the underperformance of learners, which was considered in part to have resulted from poor foundational knowledge.

The intervention programme was implemented from July to November 2007. It involved 20 hours of extra classes after school hours in the two learning areas mentioned. Learners in project schools volunteered to attend these extra lessons in only one or both of the learning areas. Baseline information had been collected on learners' achievement levels and related contextual information before the project started.

The learners came from pairs of well-selected project and control schools. To keep as many conditions as consistent as possible, schools from only one Education District in the Western Cape (Metropole-South) participated. Eight potential control schools had initially been invited to complete baseline information. These eight were reduced to four before the project started. This was done on the basis of how similar conditions at each of the four schools were to the conditions at the project school that had to form the other member of each pair. Baseline information comprised learner achievement on a multiple-choice Mathematics and English test, as well as various pieces of contextual and background information from learners, their parents, teachers, tutors and school principals. Classrooms and school sites were also observed, and document review took place at the level of schools, teachers and learners on aspects such as facilities, systems and management practices. The same learner tests were administered after completion of all the extra lessons.

The technique used to determine if learners from project schools benefited from the extra lessons, was to compare how much their performance level improved over time in comparison with that of learners from the control schools. Findings from the initial project in 2007 were inconsistent. The improvement of project-school learners' performance was also smaller than hoped for. Project-school learners with high attendance levels at their Mathematics tuition sessions consistently improved more over time than those project-school learners who had attended less well. In terms of English tuition, project-school learners' performance improvements slightly exceeded those of control-school learners. Many contextual and background factors seemed to have influenced the findings further. They included: the expertise of tutors; some school and classroom factors (such as levels of order and discipline, and time on task); and many parental and learner factors (such as opportunity to read and write, and general learner support). The findings suggested that learners who had fallen behind and failed to master foundation knowledge, even as early as the Foundation Phase, struggled with their performance in Grade 8. They were also unable to benefit from the extra lessons.

In the report on the 2007 study it was recommended that the original cohort of learners be traced into their school future. The present study obtained a set of common marks for the original project and control learners another year down the line. These marks entailed their Grade 9 exit score compiled from continuous assessment during 2008 and Common Tasks of Assessment (CTAs) towards the end of the year.

Findings from the 2008 follow-up work point to learners' language ability, particularly its improvement, being a strong factor influencing their performance in almost all other learning areas, that is, across the curriculum. The effects of the earlier additional tuition after school seem to have become stronger and more widespread over time. Learners from project schools gained much more, over a very broad front, compared to learners from control schools. The size and consistency of the outcomes for project-school learners who had attended their tuition sessions very well were even more encouraging. Initial Mathematics tuition had lasting effects on the expected numbers-based learning areas such as Natural Sciences, Mathematics and Economic and Management Sciences. The initial English tuition also benefited learner performance over time in these learning areas, but also in the more closely related text-based learning areas. Additional Language learners benefited more than First Language learners.

The effects observed in the 2008 study were much more consistent and widespread than those initially observed for the original 2007 study.

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The origins of the project (background)

The project originated towards the end of 2006. The original study was completed towards the end of 2007, and reported on in 2008. It was developed as a demonstration or pilot research project. The PlusTime study explored the effect of increasing the teaching time for Mathematics and English on the overall academic performance of learners. These two learning areas aligned with two core thrusts driving the work of the Shuttleworth Foundation, which funded both the original and this follow-up project. Improvement in the learning area of English was aligned with how best to develop communication skills, and improvement of Mathematics with how best to develop analytical thinking skills among learners while at school.

The original study entailed: selecting project and control schools; conducting pre-tutorial learner assessment; collecting baseline contextual information; preparing tuition materials; recruiting tutors; setting the tutorial timetable; delivering the tutorial programme; and conducting the post-tutorial assessment and information collection, all during May to November 2007. Additional lesson time was afforded by inviting learners to come for extra tuition after school.

Research ethics

Both the original study of 2007 and the follow-up collection and analysis of Grade 9 exit marks from 2008 were approved formally by the Human Sciences Research Council's Research Ethics Committee.

Scholarship

The literature and theory cited at the onset in 2007 appear in the initial project report, and support the claim that literacy underpins all further acquisition of concepts, meaning and knowledge. An article on the findings of the study is in process, and will be submitted to an international journal for peer-review soon.

Problem statement

Learner achievement is not at an acceptable level. This situation is aggravated by resource constraints at schools and impoverished living conditions at home. These factors may imply that classroom time and effort cannot be confirmed optimally through homework. The question was how to amplify school-based work contents and rates through after-school tuition or assistance of some sort to improve learner performance.

Rationale for the study

It was hoped that confirmation of in-school knowledge transfer through a structured after-school mechanism would enable learners to master more of their work and improve their performance within a relatively short time, with some lasting effects, even across learning areas.

Hypotheses

A primary objective was to search for practical and affordable ways to extend in-school teaching time. The study explored one such after-school intervention. The procedure had been designed to increase the ability of learners to master their regular school work as they go. A 10 percentage-points greater performance improvement of learners from project schools above a comparable group of control learners was hoped for (within a year). Any such gains should be sustained over time. The latter would be assessed at the end of 2008 (as reported in this follow-up study), a year to 18 months after the first study, when the project learners would complete Grade 9.

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Design, methodology and sample

Salient features of the original study and additional information on the Grade 9 follow-up are presented below.

The purpose and objectives of the study

The original study was designed to inform the Shuttleworth Foundation and the Western Cape Department of Education about the extent to which it was possible to develop and implement a cost-effective and practical measure aimed at improving learner proficiency over the short term through extra tuition after school in Mathematics and Language. The effects had to be specific to the two learning areas mentioned, but also across the curriculum pertaining to learner performance on the whole. Any achieved effects also had to be sustainable over a longer period of time. Critical discussion, as agreed between the funding, research and client organisations, would follow to help stakeholders engage in the policy implications of the findings.

Approach to the study (design and methodology)

A paired control-group design was followed. This means that learners would either belong to a group of project schools, where they would participate in an intervention, or a group of control schools, where they would not. Schools' management, in consultation with the Metropole-South Education District office, volunteered to be part of the project group. Schools also made themselves available on the same basis for the control group. The number of potential control schools identified at the outset was twice the number of project schools to ensure that project and control schools could be paired off properly on the basis of how similar conditions at each of the eventual four pairs of project and control school were. Baseline information served as a basis for the pairing, and comprised learner achievement on a multiple-choice Mathematics and English test, and various bits of contextual and background information from learners, their parents, teachers, tutors and school principals. Classrooms and school sites were also observed, and document review took place at the level of schools, teachers and learners on aspects such as facilities, systems and management practices.

With knowledge of the learner proficiency levels of every learner in June 2007 (within their pairs, or as a whole), their progress could be monitored over time till after the intervention (November 2007), or later (at the end of Grade 9 in 2008). Collection of the latter set of achievement results enabled researchers to reach conclusions about the sustainability of project effects.

“Difference-in-difference” analyses were conducted to determine if the extra lessons had a lasting effect on the performance of the project learners. The term “difference-in-difference”, also sometimes called “double-difference”, refers to the comparison of the expected **increase over time** in level of learner achievement **between the two groups** (project and control). The following schematic view portrays this in more detail:

GROUP	BASELINE	OUTCOME	CALCULATIONS
Project schools:	Jun 07 marks*	Nov 08 marks*	1 st difference score (Nov 08 marks minus Jun 07 marks)
Control schools:	Jun 07 marks*	Nov 08 marks*	2 nd difference score (Nov 08 marks minus Jun 07 marks)
Comparison:	Difference-in-difference score → [2 nd difference score minus 1 st difference score] **		

* All marks refer to the mean performance (expressed as a percentage) of the relevant learners at the time indicated.

** The result of this calculation should ideally exceed 10 (= percentage points) to show an intervention benefit to the project learners.

Sample

The study was pitched at Grade 8 level in 2007. An intervention at this stage was considered to be in time still to remedy some of the gaps in foundational knowledge that had been assumed to exist among early high-school learners. These learners completed Grade 9 at the end of 2008.

Procedures

Development of the tutorial contents

The initial report after the study of 2007 comprises a complete discussion of this aspect. Suffice it to say that a team of Mathematics and English teachers, expert in the respective learning areas and coming from the education district, compiled materials for 20 lessons in each learning area. The lessons covered various teaching approaches and modes of learner participation, used specific worksheets and exercises, and also addressed some numeracy and literacy contents that learners typically struggle with in Grades 6 and 7. The session worksheets fitted into 60 minutes, and comprised the introduction of a theme/topic, and some group or individual assignment, sometimes involving completion of an exercise afterwards.

The recruitment of tutors

Tutors were recruited from the teacher groups in the various schools, or wider within the education district in some cases, and issues of remuneration, incentives and training for the task dealt with.

Baseline administration of learner performance assessment and contextual survey instruments

Baseline information was collected in 2007 before the start of the extra lessons. It took the form of learner performance assessments and contextual surveys among learners, parents, teachers, tutors and school staff.

Implementation of the tutorial programme

The Department gave permission, after the labour-action events during June 2007, to extend the tuition sessions of 20 hours in total into the fourth quarter. The eventual delivery period was July to November 2007. Detailed learner attendance records and related information were also obtained.

Matching of groups

On the basis of contextual information on the schools, classrooms, teachers, learners and parent community, four project and four control schools were paired at the beginning to control non-systematic influences. This allocation remained unchanged for the present follow-up analyses.

Post-intervention learner assessment

The participating learners from the four control and four project schools were assessed in November 2007 by means of post-tests in English and Mathematics, using the same instruments as for the pre-test of June 2007. For the current second evaluation, Grade 9 exit marks were obtained. These comprised continuous assessment (CASS) and common tasks of assessment (CTA) components, in a 75:25 ratio. The Department provided the marks on the basis of the list of 774 project and control learners from the 2007 study. (It is hoped that their progress can be monitored again on completing Grade 12 at the end of 2011, pending further permission.)

Instruments

The information, collected at the baseline according to an instrument grid specifying the required sources and modes, remained unchanged (see the initial report on the 2007 work), with the only exception the addition of the Grade 9 exit marks from 2008 for all participating learners from the project and control schools.

Sampling outcomes

Before indicating the extent to which the 2008 Grade 9 exit marks covered the original sample of learners from the 2007 study, the outcome of the pairing of project and control schools is briefly repeated.

Matching / pairing project and control schools

Having considered all the available background and contextual data for eight potential control schools and the designated four project schools, the best possible pairing of schools had the following result:

Project school	Control school
Ocean View	Aloe
Fairmount	Steenberg
Vuyiseka	Phakama
Intsebenziswano	Siyazakha

The wide range of variables used to pair off the schools included constructs related to school and classroom functioning, the socio-economic status of learners and parents, and other socio-contextual factors.

Sample realisation

In 2008, the marks of 624 learners (81% of the original 774 from 2007) could be traced at the Grade 9 level. The marks of 150 learners could not be found. This was due to the following possible reasons:

- Learners might have failed Grade 8 in 2007¹ and therefore did not reach Grade 9 (n=61) in 2008.
- Learners might have left the Province and therefore no longer appeared on CEMIS (most of n=89).
- The Unique Learner Identification Number from CEMIS might have been completed, captured or transcribed incorrectly, making it impossible to trace the learner (only a few of the same n=89).

Included in the 624 are 12 learners (1,9%) who had not been promoted to Grade 10 at the end of 2008. This may compare well with the 45 from 774 (5,8%) known to have failed Grade 8 in 2007. This figure, and that of the remaining 105 learners (13.6%), of whom most could be assumed to have dropped out of the system, may be indicative of some trends, although the data and its categorisation are too uncertain.

Project- and control-school learners were evenly distributed in these figures². Systematic effects would be unlikely to (dis)advantage any sub-group in terms of performance gains over time. The marks of the learner groups shown in the three tables below are considered sufficient for analyses, as a result. It should be noted that the Grade 9 exit marks distinguish between English taken as First and Additional Language. The direct effects of the level and fact of attending extra lessons are reported next in Section 3.

Numbers of achievement marks retrieved for Mathematics and English First Language learners

Stage of testing		Both English pre-test (2007) and Grade 9 First Language exit (2008) marks		
		No	Yes	Row totals
Both Mathematics pre-test and Grade 9 exit marks	No	73	104	177
	Yes	379	68	447
Column totals		452	172	624

Numbers of achievement marks retrieved for Mathematics and English Additional Language learners

Stage of testing		Both English pre-test (2007) and Grade 9 Additional Language (2008) marks		
		No	Yes	Row totals
Both Mathematics pre-test and Grade 9 exit marks	No	129	48	177
	Yes	206	241	447
Column totals		335	289	624

Number of learners with achievement marks per research group, learning area and project stage

Research group	Project stage / sub-groups	Mathematics		English First Language		English Additional Language	
		Pre-test	Gr. 9 exit	Pre-test	Gr. 9 exit	Pre-test	Gr. 9 exit
Project schools	Paired testing	193	193	74	74	133	133
	All tests	197	273	211	85	211	188
Control schools	Paired testing	254	254	98	98	156	156
	All tests	254	344	254	149	254	196

¹ Comprising 45 of the 61 mentioned (or 5,8% of the original 774), and who started Grade 9 at the beginning of 2009.

² The 11 high-attendance Mathematics learners who left had a 5,7 %-points weaker performance than the 91 learners remaining in the data. The relevant difference-in-difference comparisons would then be lower by at most 0,6 points.

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Findings

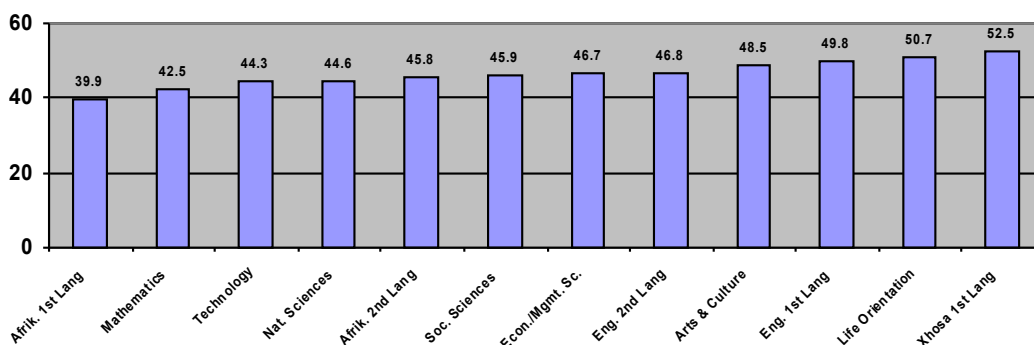
More findings exist than are reported here. For this brief version of the report, only the most central findings have been selected. In addition, an attempt was made to portray such findings in as visually clear a way as possible, and to leave out unnecessary technical contents. For the latter, one has to consult the original (technical) reports on the 2007 study and its follow-up on Grade 9 learner exit marks in 2008.

The aspects mentioned hereafter are not referred to or repeated in this report. They are: the contextual profiles underpinning learners' performance; tuition programme implementation and attendance; baseline and first post-project assessment levels of learner performance; the initial difference-in-difference analysis on the impact of the tutorial programme³ after six months; and the effects that contextual variables had on learners' performance improvement over time, given their participation or not in the tutorial programme.

What the remainder of this report does focus on, then, is whether or not the follow-up Grade 9 exit marks from 2008 would show any positive longer-term effects (after a year to 18 months) among those learners having undergone extra tuition, including those who had shown high attendance levels at these tuition sessions.

One more comment about the nature of the Grade 9 learner achievement marks is in order. Even though the low performance levels during the 2007 testing were commented on, it is not possible to tell if or how much those levels actually improved over time. The main reason is that different items and assessment contents were used to obtain the new marks. Direct comparisons of level of performance would only be possible through techniques such as equating, if one had inserted at least some common test items between the years. This also applies to comparisons between learning areas. This situation does not, however, compromise the rationale of using difference-in-difference calculations in the study. The main reason is that common process and standard procedures were still followed for all learners across the project and control schools, and that the main interest is in the relative improvement that the two sub-groups on average made over time.

A great gain in the value of this second post-assessment comparison is that marks for many more learning areas now became available. The graph below portrays the learner achievement outcomes to give a sense of performance levels in the various learning areas.



Graph showing learning area performance (in %) of all learners for Grade 9 exit marks in 2008

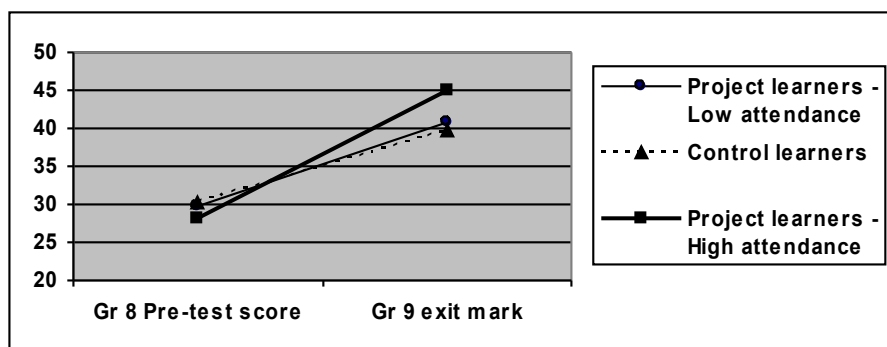
³ Given the small size of the sample, and as with the findings from the initial study, one can only speculate that tutor identity, related to factors such as their pedagogical approach, proficiency in a learning area, and level of motivation, may have been decisive in determining whether or not their learners' achievement improved over time. For English, there were indications that tutors' curriculum management and assessment/feedback practices had an influence too.

The bars indicate average percentage scores, and are ranked from lowest to highest. The scores of 624 learners⁴ are included, only reduced by the fact that single learners had been absent on a given assessment day, and with the exception of learners not taking all language learning areas (i.e., Afrikaans Home Language (n=110); Afrikaans Additional Language (n=298); English Additional Language (n=384); English Home Language (n=234); and Xhosa Home Language (n=271)). The lower achievement levels that occurred in Afrikaans Home Language, Mathematics, Technology and Natural Sciences, and the higher levels in English Home Language, Life Orientation, and Xhosa Home Language, perhaps provide some clues as to the noted learner proficiency or learning area difficulty issues.

The reporting below has two objectives. The first purpose is to show if and with how much learners from the project schools were indeed better off than learners from control schools. The second aim is to detect and show if and with how much learners within the project group would be better off if they maintained high attendance levels at the sessions, compared to those with lower attendance levels. These two strategies could also be combined by comparing how much more the (hypothesised) gains of those project-school learners with high tuition attendance would be beyond the gains by control-school learners. The cut-off point for good attendance was set at 82%, or missing no more than three of the 20 sessions.

The sustained effect of additional Mathematics tuition on Mathematics performance

The next graph shows that, across the whole sample, learners from project schools who attended their Mathematics lessons well (n=91) experienced a 16,9 percentage-point difference in Mathematics performance over time, which is 7,4 points greater than the 9,5 percentage-point difference for learners from control schools (n=254). This situation applied very strongly in the case of two school pairs, and was the inverse to only a marginal extent in the remaining two school pairs. (Within the project schools, this 16,9 percentage-point difference of high-attendance learners was 5,8 points more than the 11,1 points percentage-point difference for low-attendance learners (n=63). This situation was consistent across all project schools.)



Pre-test (2007) and Grade 9 exit (2008) Mathematics scores for all project- and control-school learners

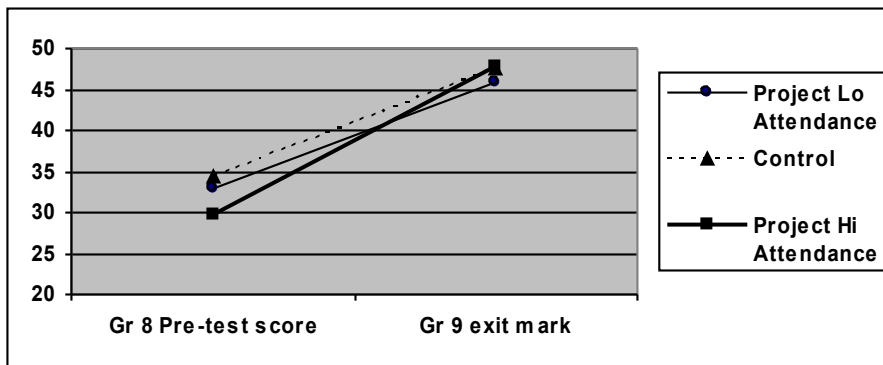
The data suggests a real possibility to remedy learner performance levels as late as in Grade 8 through an intervention of as little as six months with lasting effects 12 to 18 month later, provided a good level of commitment exists among learners and tutors. Some inconsistency remained in terms of the ability of project schools to outperform control schools in two of the three school pairs where it had initially been the case, although the overall picture has changed in favour of the project schools since 2007, when control schools seemed to be better off, relatively speaking. This could be seen as an indication that some intervention effects do not take effect immediately, but may manifest over a longer period.

The sustained effect of additional English tuition on English Additional Language performance

The next graph shows that, across the whole sample, learners from project schools who attended their English lessons well (n=62) experienced an 18,0 percentage-point difference with English Additional Language performance over time, which is 4,9 points greater than the 13,1 percentage-point difference for learners from control schools (n=156). This situation applied consistently across school pairs, with the exception of one, where the inverse applied to the marginal extent of a -0,4 points difference. (Within the project schools, this 18,0 percentage-point difference of high-attendance learners was 5,1 points more than the 12,9 points

⁴ Project- and control-school learners combined, since later analyses will account for this split.

percentage-point difference for low-attendance learners (n=57). This situation was consistent across all project schools except one, where no high-attendance learners were available to allow this comparison.)

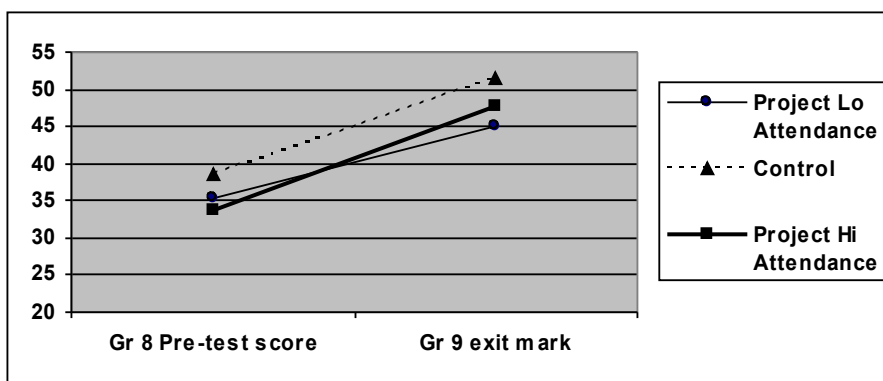


Pre-test (2007) and Grade 9 exit (2008) English Additional Language scores for all project- and control-school learners

Again it seems possible to remedy performance levels as late as in Grade 8 with some lasting effect through a dedicated intervention. However, some inconsistencies still apply with regard to the ability of project schools to outperform control schools in the case of one school pair, albeit a different one to 2007. However, the extent of the advantage of project-school learners above control-school learners increased quite a bit. This could mean that initial small intervention effects may incrementally grow as time passes.

The sustained effect of additional English tuition on English First Language performance

The graph below shows that, across the whole sample, learners from project schools who attended their English lessons well (n=44) experienced a 14,0 percentage-point difference with English First Language performance over time, which is 1,2 points greater than the 12,8 percentage-point difference for learners from control schools (n=98). The consistency of this across school pairs could not be determined because of low frequencies in many sub-groups. (Within the project schools, the 14,0 percentage-point difference of high-attendance learners was 4,2 points more than the 9,8 points percentage-point difference for low-attendance learners (n=28). The consistency of this across project schools could not be determined because of low frequencies in many sub-groups. The main reason for this is that for a majority of learners in the sample, English is not their mother tongue.)



Pre-test (2007) and Grade 9 exit (2008) English First Language scores for all project- and control-school learners

At the overall level, and for one of the two project schools where sufficient data were available, the situation of 2007 pertaining to the slight advantage that high-attendance learners enjoyed over low-attendance learners, prevailed up to 2008, although the inverse situation continued for the second school. However, possibly for reasons of the smaller learner numbers in this set of comparisons, many inconsistencies apply with regard to the ability of project schools to outperform control schools. The absence of consistent patterns could also be indicative of first-language learners' ability to benefit from further learning in subsequent grades on their own, so to speak, because their foundation knowledge enables them to, so that additional tuition would not matter.

The sustained effect of additional tuition on performance across the curriculum

As mentioned earlier, a wealth of information became available for the participating learners at the end of 2008 in the form of their Grade 9 exit marks for all learning areas. They were (as clustered in the columns):

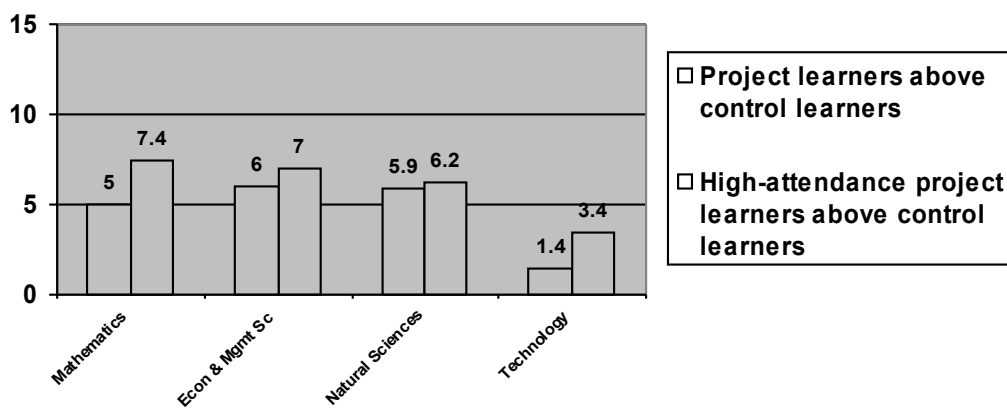
Related to Mathematics/Numeracy	Related to Language/Literacy	Unrelated directly
Economic and Management Sciences	Afrikaans Additional Language	Arts and Culture
Natural Sciences	Afrikaans First Language	Life Orientation
Technology	IsiXhosa First Language ⁵	Social Sciences

The learning areas in the first column share the use of numbers, arithmetical calculations and other mathematical procedures with the learning area of Mathematics. The middle column comprises the remaining language learning areas, while the third column shows the non-language (in a direct sense), non-numbers based learning areas, or, put differently, the generally text-based learning areas. The integrated approach to learning contents across learning areas or the curriculum is acknowledged, and the classification above is not meant to deny that, only to focus on features at the core of each learning area.

Analyses identical to the ones reported so far in the section were conducted. However, for clarity of reporting, only two comparisons in the case of each learning-area combination are included. The first is the difference in performance gain over time of the project-school learners above the control-school learners. The second is the same gain difference, but adjusted to include only those project-school learners with high attendance levels at their tuition sessions. Four sets of graphs are used to make it possible to group the comparisons more logically in terms of which initial learning areas of tuition and which Grade 9 exit marks are dealt with. For ease of comparison, the outcomes already reflected above for Mathematics and English are included below.

Mathematics baseline/tuition (Jun 2007) to numbers-based learning area Grade 9 exit marks (Nov 2008)

The consistent greater improvement over time in achievement level of learners from project schools compared to learners from control schools is evident from the graph below, although the difference in gain has not reached the 10-point target, especially in the case of Technology. The trend remains the same when only including project learners who had attended their tuition sessions very well, with the consistent feature that the gain difference increased, showing the impact of attendance level in addition to the interventions as such.



Difference in performance gain in percentage points for project-school learners above control-school learners from Grade 8 Mathematics marks in 2007 to Grade 9 exit marks in 2008 (numbers-based learning areas)*

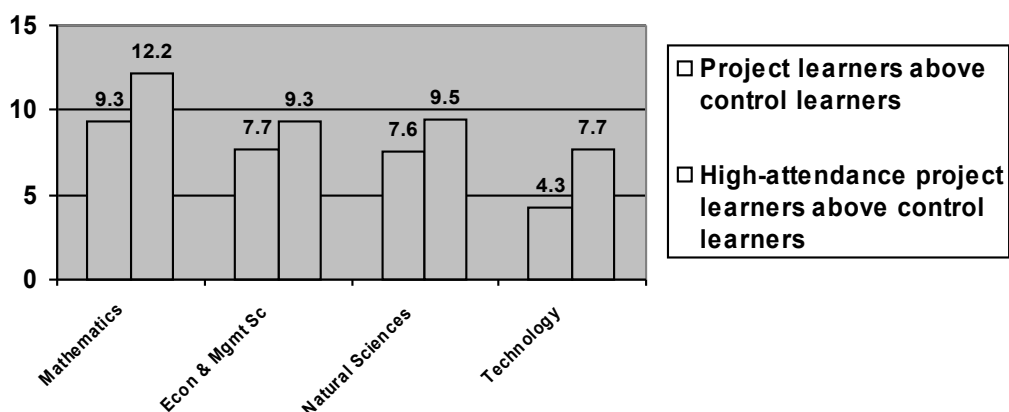
* Frequencies depended slightly on learner presence on the days of assessment, but are the following: control learners = 253 or 254; all project learners = 151 to 154; high-attendance project learners = 90 or 91. (Cases used when pre- and post-marks were both available.)

English baseline/tuition (Jun 2007) to numbers-based learning area Grade 9 exit marks (Nov 2008)

The consistent greater improvement over time in achievement level of learners from project schools compared to learners from control schools is evident from the graph below, and the difference in gain reaches towards the 10-point target in all cases except that for Technology. The trend remains the same when only including project learners who had attended their tuition sessions very well, with the consistent feature that the gain

⁵ As there were only two learners with isiXhosa Additional Language, the marks received were not used in analyses.

difference increased to very close to or exceeding the 10-point target in three of the four cases, with the situation for Technology also having improved much. These figures show the impact of attendance level in addition to the interventions as such.

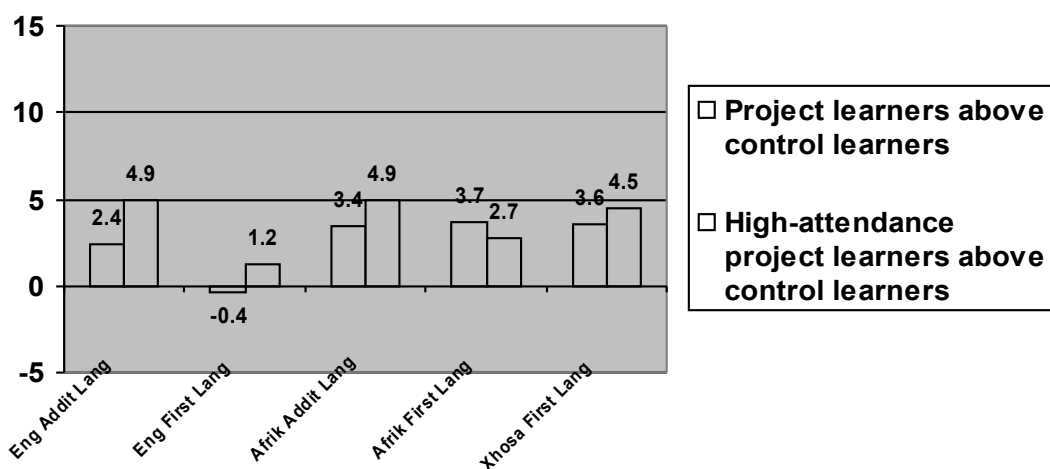


Difference in performance gain in percentage points for project-school learners above control-school learners from Grade 8 English marks in 2007 to Grade 9 exit marks in 2008 (numbers-based learning areas)*

* Frequencies depended a bit on learner presence on the days of assessment, but are the following: control learners = 253; all project learners = 188 to 191; high-attendance project learners = 104 to 106. (Cases used only when pre- and post-marks were both available.)

English baseline/tuition (Jun 2007) to language learning area Grade 9 exit marks (Nov 2008)

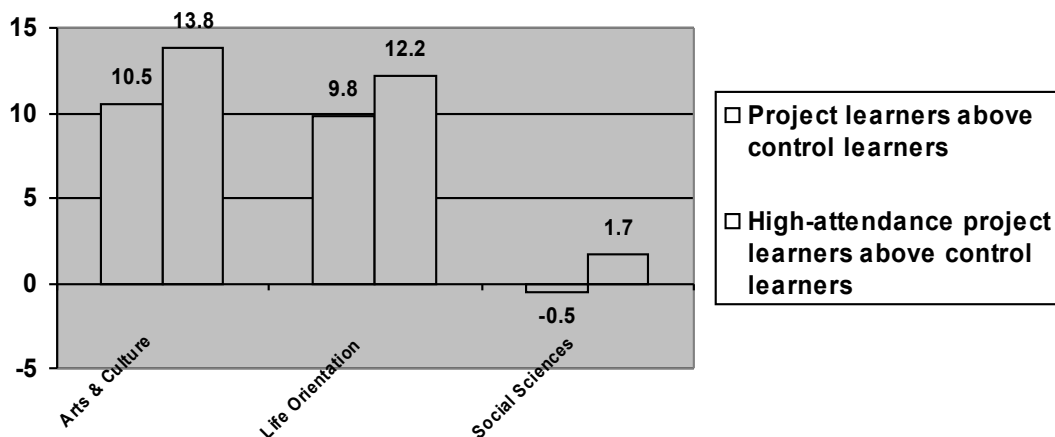
With the exception of English First Language the greater improvement over time in achievement level of learners from project schools compared to learners from control schools is consistent, although the difference in gain never exceeds the 5-point mark. With regard to English First Language, it was speculated earlier in the report that this group was already at a level where initial tuition had not been able to help them further. The trend (of project-school learners out-gaining control-school learners) is consistent when only including project learners who had attended their tuition sessions very well, and got close to the 5-point mark in three of the five cases. This gain difference also increased in comparison with the one involving all control-school learners, with the exception of Afrikaans First Language. The reason for this exception is not immediately clear, but could be linked to the fact that this learning area suffered the lowest performance level in the study, as well as in a previous piece of work undertaken by the researchers in the Province, or because of the low frequency of learners in this sub-group. These figures only partly confirm the lasting impact of attendance level in addition to the interventions as such.



Difference in performance gain in percentage points for project-school learners above control-school learners from Grade 8 English marks in 2007 to Grade 9 exit marks in 2008 (language learning areas)*

* Frequencies depended slightly on learner presence on the days of assessment, but are the following, in the order reflected on the x-axis in the graph: control learners = 156, 98, 161, 16, 140; all project learners = 119, 72, 72, 35, 81; high-attendance project learners = 62, 44, 44, 10, 50. (Cases used only when pre- and post-marks were both available.)

The greater improvement over time in achievement level of learners from project schools compared to learners from control schools is evident in two of the three learning areas in the graph below, and the difference in gain is at the 10-point target in both cases. The exception is for Social Sciences. What the reason for this may be, is not easy to say, but it could lie in the curriculum content of the learning area. The trend remains the same when only including project learners who had attended their tuition sessions very well, with the gain difference now stronger and above the 10-point target (for the two relevant learning areas). These figures show the impact of attendance level in addition to the interventions as such.



Difference in performance gain in percentage points for project-school learners above control-school learners from Grade 8 English marks in 2007 to Grade 9 exit marks in 2008 (text-based learning areas)*

* Frequencies depended slightly on learner presence on the days of assessment, but are the following: control learners = 253 or 254; all project learners = 187 to 191; high-attendance project learners = 104 to 106. (Cases used only when pre- and post-marks were both available.)

(Tables 4.16 and 4.20 in the technical report contain all the detail underpinning the preceding four graphs. These tables in 70% of the comparisons show that high-attendance learners gained greater than 4 points more with progress of time compared to low-attendance learners, indicating the extent to which good tuition attendance is a prerequisite for interventions such as this one. For the same extent of 4 points greater gain over time for learners from project schools compared to those in control schools, 60% was the result. The latter outcome is encouraging in terms of signalling that assistance in Mathematics may later, and with lasting effect, benefit learners in terms of their performance in other numbers-based learning areas, as would assistance in English benefit lasting performance gains in both numbers-based and non-language text-based learning areas. The effects across the curriculum have been relatively strong. The detail of outcomes for individual schools and school pairs are also found in the technical report, namely in Tables 4.17 to 4.19. Good tuition attendance in Schools 1 and 4 were particularly influential, while benefiting from the after-school tuition as such, compared to being in control schools, evident in School 2, but also Schools 3 and 4.)

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Implications of the findings

Conclusions

Enough of the Grade 9 exit marks from 2008 could be recovered for those learners who had participated in the project during 2007 as Grade 8s to allow meaningful analyses. The majority of the 150 learners for whom no new marks could be obtained had either left school already or had not passed Grade 8 at the end of 2007.

The additional provision of Grade 9 exit marks beyond the initial learning areas of interest, Mathematics and English, created a big advantage. It allowed more nuanced analyses of the sustainability of initial impacts.

Much has been learnt, as a result, about the effects of tuition and tuition attendance on learner outcomes after some time had passed (between 12 and 18 months, in fact), as well as the relative strength of any effects.

Learners (within project schools), who had attended their tuition sessions well over a year before, gained more over time than learners who had not done so. This applied not only to almost 75% of the comparisons (learning area combinations and/or school pairs), but also to the extent of the increases in performance marks, turning out to have been five to almost ten percentage points more than for those who had not attended well.

In over half of the combinations learners who had undergone extra lessons gained more over time in performance than those who had not, and the outcome was in the order of four to nine percentage points.

These effects were even stronger when comparing the performance improvements of only those project-school learners who had attended their tuition sessions well against the gains by control-school learners.

- In three cases, the effects exceeded 10 percentage points, all associated with the initial English tuition. It involved two text-based (Arts and Culture, and Life Orientation) and a numbers-based (Mathematics) learning area. This finding suggests that attention to the language and communication proficiency of learners was able to alter their marks by 12 to 13 percentage points more compared to the control learners.
- In five other cases (tallying already to 8 of the 16 comparisons) the effect size was in the 7 to 10 percentage-point range, mostly around an 8 to 9 percentage-points higher gain.
- In three more cases, gains were 5 to 7 percentage points more for the high-attendance project learners than the control learners, and only in five cases lower than that, but never negative.

Initial Mathematics tuition seems to have had its strongest effect on Mathematics, Natural Sciences and Economic and Management Sciences. However, in all the numbers-based learning areas, also Technology, English tuition had an even stronger effect. English tuition also had a strong effect on the two text-based learning areas of Arts and Culture, and Life Orientation. The remaining effects of English were strongest in the Additional Languages (Afrikaans and English). This suggests that the interventions were most helpful where learners were more likely to struggle, rather than for their first languages. The tuition materials may also have been pitched at more basic levels, which would have been passed already by First Language learners, or where they would benefit from wider exposure to competent peers, parents and other users.

Effects also appear to have become more pronounced over time, serving as partial confirmation of the assumption that learning is cumulative, i.e., that later knowledge acquisition builds on earlier learning. This finding about the foundational role of language, also towards non-language and numbers-based learning areas, is of great practical significance, also within the context of related dynamics of support and enthusiasm.

Implications of the study

The key implication is that sustained (or delayed) and incremental gains seem possible. Not only did the benefits remain evident after some lapse of time, but they also became quite pronounced and widespread.

One could claim with some confidence that the school- and district-based development and implementation of an after-school extra-tuition initiative, such as PlusTime, have been meaningful and should render practically significant results as time passes. It brings hope that some of the backlogs that learners carry at the time that they embark on their secondary-school careers could still be addressed.

One would have to account for the dynamic circumstances, conditions and role-player influences in the teaching and learning system to inform any decisions on the fact and mode of similar future programmes.

The initial thinking to locate the ownership and management of such an intervention (materials development included) within the school and district context seems to have paid off. Although one may do better to design top-of-the-range materials, hire the best experts, and achieve maximum sophistication, that would render a programme unaffordable and undermine buy-in. Local enthusiasm, common will, and a few key people to drive the implementation would be central, and indeed entail a very practical and implementable advantage.

The focus should remain on the overriding issue ensuring that teaching time within school hours is not eroded. Should new-entry learners suffer knowledge backlogs, additional time should be made available, with the demonstrated promise that it would be able to address some of the gaps in foundational knowledge.

The obligation that remains now is to debate the findings widely to establish if they could shape changes to any existing knowledge, practices and policies. It is hoped that through policy debate the influences and recommendations of this study will filter through gradually into improved practices in many spheres.

Recommendations

Interventions should be kept as indigenous to schools and teachers as possible to avoid potential ramifications with capacity and funding. Teachers should be ready to identify and be assisted to help, through spending extra effort, most likely, those learners entering high school with gaps in their knowledge foundations.

The Department of Basic Education should continue with and intensify its existing broad-based interventions that focus on literacy and numeracy development in the Foundation Phase, in particular in view of the strong Grade 9 exit results reported here. Funding cuts should be avoided at all cost. (The recommendations from the original report should also be consulted in this regard.)

The related areas of interest formulated after the initial evaluation remain very topical and should remain on the Department's research agenda, in discussions, and as potential future projects. These would include:

- Piloting the idea of and dynamics behind twinning high schools with their feeder primary schools.
- The process whereby principals and school management teams allocate learning areas to teachers to teach.
- The extent, dynamics and effects of passing learners on to a next grade without having mastered the prescribed curriculum of a current grade.

The value of research, through evidence-based findings, has been confirmed, and gives strong encouragement for undertaking future projects of this kind. The intended second follow-up evaluation at the end of 2011 should be remembered, given the positive outcomes so far. The present cohort of learners should be tracked to Grade 12 to establish who persevered to that point, and at which levels of achievement. Another small expense could secure good information about the long-term sustainability of the PlusTime interventions. The final decision on this lies in the future. The Shuttleworth Foundation would be a likely funder of this, and may consider, with other agencies, to sponsor further extra tuition in selected schools during the coming years.

Wide dissemination of these additional findings should again follow. These would include relevant websites, various submissions and presentations at dedicated management and other meetings, and public discussion and releases through local radio stations and newspapers (interviews and articles), for instance.

Acknowledgements

A summary of the many individuals, groups and organisations, without whom the project would not have happened, includes:

- the learners, parents (and other caregivers), teachers, coordinators and principals of the project and control schools;
- the tutors responsible for delivering the extra classes after school;
- the Metropole-South Education District's managers and other officials;
- the project manager from Metropole-South Education District;
- the various managers and officials in the Provincial office of the WCED;
- the independent coordinator, Ms Lynette Maart, who throughout linked the client, the funding organisation and the research team to each other;
- the funding organisation (the Shuttleworth Foundation), who also provided an additional amount of financial support for the present follow-up monitoring and analysis;
- HSRC colleagues who formed part of the research team and otherwise, including Ms Erika Masser as new project administrator, and Ms Mbali Mkhize from the Corporate Communications office who assisted with dissemination; and
- various stakeholders, academics, and other parties.

In addition to the few new names mentioned above, the following people made sure that the follow-up data on learner performance got selected and provided to the researchers from the systems of the Western Cape Education Department. Ms Zodwa Modimakwane, Mr Theo Hamman, Dr Ronald Cornelissen and Dr Andile Siyengo were of particular help.

In closing, many journalists and reporters from provincial, regional, local and community newspapers and radio stations played a major role to disseminate the original findings. Far more than 30 interviews and/or articles appeared in the period of two to three months immediately following the release of the original report during 2008. It is hoped that this present release of additional findings in 2009 will soon meet with similar interest and enthusiasm.

Note: The photograph on the cover page was taken by Dr Tshilidzi Netshitangani of the Human Sciences Research Council at Titirheleni Primary School during site visits in September 2007 for a study of literacy teaching practices conducted for the Limpopo Department of Education with funding from Irish Aid. It signifies the importance of making optimal use of time and striving towards excellence in the life of a learner.

The present report is an abbreviated version of the technical report pertaining to the second phase of evaluation of the PlusTime project. A one-page abstract is also provided at the beginning of the present report. A first evaluation report was released in 2008 on the work done in 2007. It goes without saying that both the companion technical report and the original report would be more comprehensive than this present version in providing wide acknowledgement and extensive background. New readers interested in these other documents can consult the electronic versions available on the websites of the Human Science Research Council (HSRC), the Western Cape Education Department (WCED) and the Shuttleworth Foundation (SF). The appropriate references are:

Prinsloo, C.H. (2008). Extra classes, extra marks? Report on the PlusTime project. Pretoria: HSRC.

Prinsloo, C.H. (2009). The effect of extra classes a year later on Grade 9 exit marks: Technical Supplementary Report on the PlusTime Project. Pretoria: HSRC.