Extra classes, extra marks?

Report on the PlusTime Project

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Table of contents 2

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Acronyms used

CEMIS	Central Education Management Information System
CEO	Chief Executive Officer
CTAs	Common tasks of assessment
EMDC	Education Management Development Centre (formerly a district)
ESSD	Education, Science and Skills Development (HSRC research programme)
FET / (T)VET	Further Education and Training / (Technical and) Vocational Education and Training
HET	Higher Education and Training
HSRC	Human Sciences Research Council
LTSM	Learner and teacher support material
MCQ	Multiple-choice questions
OTL	Opportunity to learn
PC	Personal computer
PIRLS	Progress in International Reading Literacy Study
REC	Research Ethics Committee (of the HSRC)
SD	Standard deviation
SES	Socio-economic status
SGB	School Governing Body
TIMSS(-R)	Trends in International Mathematics and Science Study (R = Repeat - of 3rd study)
The Foundation	The Shuttleworth Foundation
WCED	Western Cape Education Department

Abstract (one-page summary version)

After deliberations since 2006 between The Shuttleworth Foundation, the Western Cape Education Department and the Human Sciences Research Council, an agreement was reached late in 2006 to undertake a study during 2007 to pilot or demonstrate an intervention procedure that would be aimed at increasing the contact time of Grade 8 learners in Mathematics and English with a view to improving their performance in the two learning areas. This would be an attempt to explore whether the perceived serious underperformance of learners, that may also be the result of poor foundational knowledge, could be remedied through a 20-hour tuition programme delivered after school hours. It was hoped that within a year's time, a 10 %-point increase in learner marks would not be unrealistic.

The implementation of the intervention programme got delayed by the public service labour action and incumbent teacher strike during June 2007. The baseline learner performance assessment and contextual survey information collection was fitted in before that, but the tuition roll-out could only start at the beginning of the third term in 2007. Special permission was obtained to extend the programme into the fourth term, instead of it running from Term 2 to Term 3.

The study comprised a paired/matched control group design. It took place in only one "district" in the Western Cape (Metropole-South EMDC). Eight potential control schools were initially recruited, reduced to four later, and matched with the four project schools. Baseline information comprised learner performance assessments on a multiple-choice question Mathematics and English learner performance test, as well as the collection of various pieces of contextual and background information from learners, their parents, teachers, tutors and school principals. Some observation of classrooms and school sites, as well as document review at the level of schools, teachers and learners also took place to collect information on aspects such as facilities, systems, management practices, and more. After completion of the tuition, learner performance was again assessed.

This was followed by the required data capture and verification procedures, after which difference-in-difference analyses were conducted to assess if project-school learners' performance indeed improved more than that of control-school learners. The techniques used mainly comprised analysis of variance, chi-square analysis and correlation analysis.

The findings were inconsistent, and the effects smaller than expected on the whole. The main consistency, albeit of a smaller extent than hoped for, was that better attendance at Mathematics tuition sessions correlated positively and significantly with higher performance improvements over time among the project-school learners. In terms of English tuition, the slightly more consistent finding that project-school learners' performance improvements slightly exceeded those of control-school learners was heartening.

However, many contextual and background factors, as well as aspects related to the conceptualisation and delivery of the tuition sessions, appear to have probably influenced the findings further.

In short, 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 related to exposure to opportunity to read and write, and other general learner support, seem to have put a ceiling on how much learner performance could improve. A key suggestion flowing from this, also based on the very low levels of baseline performance of all the learners, is that backlogs and low foundation knowledge levels, as created as early as the Foundation Phase, seriously hamper current performance levels and the ability of learners to benefit from extra tuition in secondary school.

As a result, it is recommended that similar and other intervention programmes, also aiming at increasing contact time, especially in the learning areas of Literacy and Numeracy, be established at the Foundation and Intermediate Phase levels. Their conceptualisation and implementation should ideally be dealt with within a peer-support model, where secondary schools twin with their primary feeder schools, to identify, address and prevent the kinds of knowledge gaps that seem to appear to hamper learner performance later down the line.

Apart from many more detailed observations and recommendations (selected and summarised in more detail in the Executive Summary on p.5), the importance of language ability for performance in Mathematics (and other learning areas), has been observed clearly in a number of cases.

Executive Summary **(summary version with extended conclusions and recommendations sections)**

Background

After deliberations since 2006 between The Shuttleworth Foundation, the Western Cape Education Department and the Human Sciences Research Council, an agreement was reached late in 2006 to undertake a study during 2007 to pilot or demonstrate an intervention procedure that would be aimed at increasing the contact time of Grade 8 learners in Mathematics and English with a view to improving their performance in the two learning areas. This would be an attempt to explore whether the perceived serious underperformance of learners, that may also be the result of poor foundational knowledge, could be remedied through a 20-hour tuition programme delivered after school hours. It was hoped that within a year's time, a 10 %-point increase in learner marks would not be unrealistic.

The implementation of the intervention programme got delayed by the public service labour action and incumbent teacher strike during June 2007. The baseline learner performance assessment and contextual survey information collection was fitted in before that, but the tuition roll-out could only start at the beginning of the third term in 2007. Special permission was obtained to extend the programme into the fourth term, instead of it running from Term 2 to Term 3.

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This was followed by the required data capture and verification procedures, after which difference-in-difference analyses were conducted to assess if project-school learners' performance indeed improved more than that of control-school learners. The techniques used mainly comprised analysis of variance, chi-square analysis and correlation analysis.

Findings and conclusions

The findings were inconsistent, and the effects smaller than expected on the whole. The main consistency, albeit of a smaller extent than hoped for, was that better attendance at Mathematics tuition sessions correlated positively and significantly with higher performance improvements over time among the project-school learners. In terms of English tuition, the slightly more consistent finding that project-school learners' performance improvements slightly exceeded those of control-school learners was heartening.

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The importance of language ability for performance in Mathematics (and other learning areas), has also been observed clearly in a number of cases.

The multi-dimensional and complex nature of the study, coinciding with the teaching and learning reality in schools, implies that the more general picture just portrayed above would hide many nuanced findings and conclusions that did arise all along from the work. Some of these are focused on further next.

What became clear, among other things, are that:

- patterns differed between the learning areas of Mathematics and English,
- overall performance gains in other learning areas would only be evaluated at later stages, when marks to common assessments across learners would become available at the end of Grades 9 and 12,
- patterns differed, also between learning areas, when comparing high tuition attendance levels against low attendance levels, and project-school outcomes against control-school outcomes, when attempting to isolate the effects of the interventions,
- learner performance improvements varied depending on demographic characteristics and contextual factors pertaining to learners, their parents, teachers/tutors, and schools, and
- the nature of the study, its design features (e.g., sample-size, numbers and sizes of sub-groups, and the number of variables) and the smaller than expected improvement outcomes, were conducive to limiting the degree of confidence with which one could ascribe any effects to the interventions.

The latter item, therefore, means that over time learners' hypothesised (anticipated) increases of performance in Mathematics, English and their overall marks, would only in optimal cases perhaps reach three to six percentage points. This, in conjunction with the analysis of interaction effects with tuition attendance levels and with contextual factors, would enable one with only 90% to 98% certainty, i.e., short of the ideal of 99% certainty, to ascribe the performance outcomes to the systematic effects of the interventions introduced.

However, many meaningful trends were found, as many observations indicated relationships that were in the expected direction, although falling short of strictly-interpreted statistical significance. As a result, some theory-based or plausible outcomes can be presented for meaningful discussion by practitioners, administrators and managers, and academics in the field.

A first finding, consistent across all four research pairs, was that higher learner attendance at Mathematics tuition sessions was always related to greater Mathematics performance improvements, and the inverse. Such consistency may lead one to trust that any improvements in the study, such as any or all of larger samples, better tuition-material design, more precise tutor screening and recruitment, improved tuition delivery, improved learner performance measurement instruments and the administration thereof, and many more aspects related to optimising research variance, controlling nuisance variance and minimising error variance, may enable coming to statistically significant conclusions against strict probability criteria. An additional nuance suggested that once learners reach a certain ceiling close to where any foundational knowledge deficiencies would allow them to come, regular tuition may not be efficient any longer, as more remedial attention to earlier work would be needed.

A second key discovery, for both Mathematics and English, is that project-school outcomes were not consistently better than control-school outcomes. However, there are discussions in the full-length report about the cases / schools where it applied, and probable unique conditions for that to happen. For Mathematics, one outlier control school upset the pattern drastically, and for English, there were stronger indications overall of the benefits of tuition.

In the third instance, on inspecting the plausibility that a number of other contextual or background factors, such as teacher skill and knowledge, school conditions, home background, parental support and related circumstances, the use of time, levels of discipline, exposure to opportunity to read and write, etc., may have dampened or facilitated the likelihood of the tuition programme benefiting the participating learners, a range of meaningful observations were made from near-significant findings. Factors associated with learner demographics and context that appear to enhance the chance of learners to benefit from tuition were:

- motivation level, also associated with the commitment coming with volunteering to undergo further tuition, with girl students having an edge over boys in this
- being appropriately aged (turning 14 in Grade 8)
- having more books at home of one's own or in general
- being exposed to increased opportunities to write
- having good access to Mathematics textbooks
- not being over-extended in terms of expectations to do home chores and shopping

- perceiving one's responsibility, and the actual behaviours of self and others, to be punctual and disciplined as important
- watching appropriate television content within measure (not too much time)
- availing oneself of the benefits of using a PC.

Parental background and factors that seemed conducive to benefiting from tuition were mainly:
- higher levels of support to their children with their schoolwork
- higher qualification levels
- improved/increased reading behaviours and opportunity
- higher levels of literacy (ability to read and write)
- general exposure to the world associated with higher socio-economic status.

The identity of the learning area classroom teacher did not have a strong influence above other more important factors, but at most pertain to teachers:
- exercising good curriculum management practices
- having to teach fewer classes and/or learners
- making use of appropriate learning support materials.

In terms of the tuition delivery and tutor characteristics, it was evident that the identity of the tutor either helped or hindered learners in making progress over time. Although background information was scant and somewhat inconsistent, the following became apparent:
- higher levels of attendance as such was conducive to higher benefits
- pursuing good assessment practices and feedback was beneficial
- sound levels of curriculum management were conducive.

At the school-level, it became clear that overall management and discipline would create a generally enabling environment, but that many factors related to the management of learning areas and departments, and at the level of teachers, learners and parents, would be strong moderators in this regard.

Implications

Critical discussions between the main role players in the system of teaching and learning (learners themselves, parents, the community, teachers, principals, district and provincial officials, academics, and others) should clarify the observations and viewpoints presented next in terms of their operational, logistical, technical, professional, theoretical, disciplinary, administrative and managerial perspectives.

A creative tension will always exist between what is practical and what is right/best/perfect.

Implications for implementation within the Department

The key implication is that Grade 8 may not be the best level to primarily or only focus on. Enough indications are evident from the findings of the study to suggest that there are other role players and contexts, also and especially at earlier stages in the school career of learners, where attention should (also) be focused. Therefore, the solution to improving low learner performance does not mainly or solely lie in presenting extra tuition at Grade 8 level, but probably both earlier in the process and also elsewhere/otherwise. This position is motivated by two arguments.
- By the time that learners end up in Grade 8 with such low marks as those observed in the study, or are unable to improve them substantively, such marks are not any longer only a reflection of having reached the ceiling of one's performance maximum, because of the limits imposed by one's ability, but also the result of having had that ceiling reduced by not achieving the required learning objectives during the earlier learning phases during which basic knowledge contents had to be mastered. As a result, many of the tools that learners needed to mine subsequent knowledge, had been blunted or lost, or not even provided. This would apply within a learning area, but also for transfer effects across areas such as from Literacy to others. The language tools are precisely the key instrument for unlocking further learning.
- There would be an array of other dynamics and influences, partly evoked by the crisis situation one finds oneself in already, that would give excessive weight to factors other than the day-to-day learning and teaching events in the normal classroom. One here thinks of teacher overload, dejection and frustration at trying to first recover lost ground, and then to cover the prescribed learning contents. There would also be

learner frustrations, both at the ends of more gifted learners being frustrated at the slow pace, and of those who have fallen behind at not coping any longer with new work. Various other pressures and expectations, even apathy, from parents would come into play. So would attitudes and thought processes within learners themselves. In general, accepting the abnormal as normal and by having been pulled into putting in lots of effort and energy where it is not productive, would undermine the benefits one could gain even by attempting to afford learners extra time on task through tuition, such as studied here.

Eventual extra-tuition interventions would first have to evaluate contextual factors and other situational conditions pertaining to the intended delivery sites. Once that is understood well, some choices have to be made about the elements of the tuition approach that would be basic and common everywhere, and special foci or customisation for specific audiences. There appears to be no such a thing as a single solution for everyone, everywhere, at the same time. For a start, though, the key analysis would be if it is extra tuition that is called for, or rather different recovery plans to first normalise the situation sufficiently.

At each level, specific needs would have to be addressed and conditions factored in:
- At the level of parents, their ability to support (enable, motivate, supervise) their children is crucial.
- At the level of learners, the extent of the remediation and tuition required is key, within time and other activity and background constraints or enabling circumstances.
- At teacher level, the extent of support required or available, own conceptual knowledge levels, factors of time, capacity and workload, and learning area infrastructure and management are all important.
- At school level, the important factors are all of structural and managerial nature, and cut across aspects such as facilities, learning materials, time management, mentoring, workloads, etc.

There also seem to exist discrepancies about how matters are understood and prioritised by the various levels of the system, namely at the provincial and district offices, and schools, particularly within classrooms. Whereas needs and obligations at the level of classrooms and teachers would centre around facilities, infrastructure, workloads, remuneration, capacity, learning support material, technology, assistance/assistants, discipline, and other day-to-day delivery issues, at other levels of the system the issues are policies and programmes, security, resource provisioning, large-scale logistics, and overall management, to name a few. The experience often is one of alienation and misalignment between the two sets of role players.

In conclusion, the problem of learner performance improvement has to be accepted as pervasive and very complex, much more so than a broad range of participants may have realised. As a result, realistic perceptions are required about the development, delivery and management of extra-tuition, which schools, teachers, parents and learners have to own to give it a fair chance of succeeding.

Implications for tutorial programmes such as the one piloted

Much of the basic thinking was most likely quite sound. The broader approach and structure to such an event could be retained, but requires much attention to a range of aspects such as the following:
- high minimum criteria and expertise for tutors, which may include assessment of their prior knowledge levels to ensure that they are well up to the task
- tutors internal vis-à-vis external to the schools
- the development and quality of only the best tuition materials
- training of tutors
- monitoring of tutorial delivery
- providing formative assessment tools as part of the tutorial contents to enable tutors to assess the progress of learners (and themselves) on the achievement of their objectives
- best duration, timing and logistics behind the tutorial programme
- focusing on a maximum of one learning area for extra tuition for any learner at a given time.

On the question about teachers as tutors, more debate may be required. On the one hand, there could be disadvantages. There may be a cap on the time end effort available from the side of tutors as teachers internal to schools. This may equally put a very firm ceiling on the extent of improvement that can be expected in learner performance. Such teachers could also be tempted to remain in previous ruts, and may take many things for granted, such as their intuitive, but untested, sense of what the learners' problems and needs are, and own sense of what a good work-rate is. There could also be the risk of slacking on day-time work on the realisation that an extra opportunity is created in the afternoon. They could also deliberately go slow in

daytime to create an afternoon economy against additional reward, as already observed elsewhere in Africa. These last two matters may become severely counterproductive in terms of the initial idea of affording more time on task. However, on the other hand, there may by advantages. Teachers internal to the school may know the learners' needs very well, and have much diagnostic and other information on the areas of work not mastered well, learners not doing well, pacing, etc. Tutors from outside school, although lacking some knowledge about the intricacies within a given school, and perhaps being more expensive, may also bring about a new breeze of enthusiasm, high motivation, novelty, a good skills level, and dedicated effort, which would remedy the tight resource situation inside a school.

Tutor delivery may also be expedited by contracting tutors much more in terms of delivery or output, i.e., for example, making payments or bonuses dependent on certain levels of learner performance gain, than in terms of a required input, such as merely delivering 20 sessions.

A further matter would be to balance flexibility and standardisation with regard to tutorial material contents. The latter is required for the productive and efficient provision and distribution of a large core component by which also tutor preparation could be enhanced. However, the needs of individual schools and learners, depending on the extent of backlogs or remedial attention required, would demand some modular options, etc.

Implications for this and future research

As always, taking an in-depth look at phenomena has raised even more questions than answers. This implies that stock has to be taken to some degree of what new has been revealed, what is commonly accepted, and which gaps remain. The present findings are up for debate, so to speak, by everyone expected to see what gains can be made from them in terms of knowledge, practices and policies. In terms of the latter, not unlike all other research, it is through policy debate that it is hoped that the influences and recommendations of this study will also filter through gradually into improved practices in many spheres. (More follows later on proposed follow-up work.)

Recommendations

The study cannot recommend the immediate and expanded roll-out of the piloted intervention across Grade 8 classes in all schools of the Western Cape or the whole country. The findings were not strong and consistent enough for that. It is recommended, though, that similar and other intervention programmes, also aiming at increasing contact time, especially in the learning areas of Literacy and Numeracy, be established at the Foundation and Intermediate Phase levels. Their conceptualisation and implementation should ideally be dealt with within a peer-support model, where secondary schools twin with their primary feeder schools, to identify, address and prevent the kinds of knowledge gaps that seem to appear to hamper learner performance later down the line. The low levels of baseline performance in Mathematics and English among Grade 8 learners in the study, as well as many other indications in terms of the intervention not being able to realise larger learner performance improvements, support this call.

It is further recommended that a multi-pronged approach be followed, singling out both Foundation Phase (Grade R, and 1-3) and Intermediate Phase (Grade 4-6) interventions, with both of them interacting with Senior Phase (Grade 8) interventions. As first emphasis, all Grade R and Grade 1-3 Literacy and Numeracy teaching and learning activities should be strengthened from as many angles as possible. The purpose is to ensure that "the basics" are covered successfully.

The most important aspect would be not to allow that any foundational knowledge and concept formation gaps develop during teaching and learning in the Foundation Phase. For this to happen, teacher capacity and qualifications, resource allocation, also to learning materials, and the early identification and remediation of problem areas and learners, all have to be aligned appropriately.

Parallel to this, a strategy and structures have to be developed and implemented at the Intermediate Phase level, with continued extra support given to learners newly discovered to be battling with learning contents for Numeracy and Literacy, and further remedial attention to avoid that learners enter the Intermediate Phase without having mastered Foundation Phase contents.

As a repeat of this strategy, but at the next interface, being from Intermediate Phase to Senior Phase (Grade 7-9), new interventions and extra tuition should be developed and introduced as required, while continuing to remedially address the difficulties of learners still battling with learning contents from the previous phase.

It is recommended that a well-structured approach of twinning secondary schools with their feeder primary schools be set up, largely as a preventive strategy. This would have as purpose assistance of primary school teachers by secondary school teachers with a view to help the Foundation and Intermediate Phase teachers prepare learners for secondary school learning. Through this structured interaction the primary school teachers should be helped to identify the areas of work with which learners later typically battle, so that these receive due attention early on. Best-practice pedagogy could be fostered in this way. In addition, secondary-school teachers will also in this way help primary school teachers to identify areas and learners of concern, and how to remedy the situation, especially by providing those learners who are already in need for intervention at the Foundation and Intermediate Phase levels, with early intervention. The junior-phase teachers could also be assisted in how to develop and implement such interventions.

Crucial in all of this is that teaching time, teacher capacity, and learning materials should in no way be compromised in the Foundation Phase. No learner should be allowed to come through this phase still not being able to read and write fluently. The one bar (or what is expected from learners) that also has to be raised, is the volume of opportunity and exposure to practicing reading, writing, speaking and numeracy skills. A consistent finding across related research is that learners to not produce enough extended work of their own from early on and throughout their school careers. Additional practical, integrative and other support aspects are discussed in more detail in the main report.

Any further debates on and implementation of matters pertaining to the improvement of learner performance should accept that this work takes place in an open system, within complex processes, towards far horizons, on the back of severe backlogs, within integrated strategies.

Whereto from here?

An ongoing process of discussion, reality checking, building out the implications, adding to or refining the recommendations, and further communication and dissemination of the findings, also through professional journal articles, are foreseen.

The current report is seen as the official deliverable in terms of the trilateral agreement between the funding organisation, research institution and client organisation.

Making further submissions and presentations to the Department is not excluded from the above, and should involve the appropriate curriculum, district control, and research and development directorates and forums.

As with all studies, also this one has had its limitations. It could and did not control for tutorial content quality. It also did not set minimum expertise levels for tutors. It may have standardised and brought under central control larger parts of the training for and the administration of assessment tests and contextual instruments. The study (interventions) got interfered with potentially by the aftermath of labour action, in the form of recovery plans. The latter could not be controlled for, although initial notions are that the one school, where this would have the greatest effect, withdrew, and also, that recovery at Grade 8 level was not as severe an issue as it was in Grades 11 and 12, where most of the recovery effort was focused. General notions are that lost Grade 8 work got caught up more easily during the preceding winter holiday, or gradually within the remainder of the teaching time for Terms three and four.

The mere choice to have the study in the form of a pilot or demonstration project, almost as action research, brought a range of compromises of their own between a number of deliberated ends on continuums, as amply related at the outset of the report. These decisions restrict and enable in many senses the making of certain but not of other conclusions. Also these outcomes have been referred to sufficiently in the rest of the report, especially through the way in which the findings got presented and reported.

There may be a lot of sense in continuing to collect the post-study Grade 9 and Grade 12 learner marks in as much learning areas as would be available in another year and three years time from the Department through their CEMIS and other records, as envisaged. This would entail a rather small expense for quite a good gain in

terms of learning something about the longer-term effects or sustainability of the interventions by tracking the learners from both the project and the control schools for a while.

Separate proposal options exist for these, and the outcome would form part of the decisions by the funding organisation in discussion with the research organisation and the Department at an appropriate point. As stated in the relevant documents:

> "Ideally, comparisons should show an increase (or a maintained level) of learner performance of about 10 percentage points more for learners from the tuition group compared to those from the control group.
>
> The present cohort of participating Grade 8 learners for 2007 will progress through Grades 9 to 12 during 2008 to 2011.
>
> Should one want to make use of performance outcomes that would be identical for all learners, it makes best sense to collect their end-of-year Grade 9 (2008) common exit exam marks … early in 2009, and similarly their matric results for 2011 early in 2012. It is assumed that the CEMIS system would enable drawing on these records easily. As a result, costs can largely be limited to the labour time of the research team."

Two additional potential follow-up projects were envisaged and discussed during the official submission of the final draft version of this report to senior managers from the WCED on 23 April 2008. These were:

- Replicating, in appropriate ways and on an appropriate scale, similar after-school tuition interventions and evaluations at the Foundation and Intermediate Phases. This could ideally be done at either Grade 2 or Grade 3 level in the former case, and at any of the Grades in the latter instance, depending on the selection of the grade level for the Foundation Phase. Such a study would be able to investigate hypotheses around the best level of entry with a view to interventions promising optimal outcomes in terms of learner performance improvement. However, on review of the final version of the manuscript of this report, the relevant officials from the Western Cape Education Department already gave indications that this option would be difficult to support at this point. The main reasons for this would be that adding on to allocated teaching time may be very stressful for the learners, create complications around transport, safety and nutrition, and add to the sense of schools becoming "over researched". The latter would apply in particular when acknowledging the Curriculum Branch's current attention to further standardisation in the Foundation Phase of Numeracy content and delivery, which may be followed even by Literacy.
- Investigating in more depth and even in more qualitative ways the difference in dynamics and factors between schools respectively having been able to and not been able to show learner performance improvement over time.

In addition to these initial two themes proposed by the HSRC, Department officials (on review of the final report manuscript) also proposed that funding be sought for and proposals be prepared on the following three:

- 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.

It was agreed that the HSRC, through and with inputs from The Shuttleworth Foundation, would in due time prepare brief proposal outlines pertaining to the follow-up work envisaged above and enter into further discussions with the WCED.

As argued in the articles from *Sunday Times* (13 January 2008, cited elsewhere in the text), one thing that remains is to again remind ourselves about the size of the problem, the complexity of the teaching and learning system, and the patience and dedication required over a long time hence to meet the challenges.

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The origins of the project (background)

Two broad strands of discussion had come together towards the end of 2006 to result in the project that was completed towards the end of 2007, and is reported on here in 2008.

In the first instance, the trustees of The Shuttleworth Foundation (The Foundation) decided in March 2006 to investigate the possibility of initiating a demonstration research project. This specifically had to explore the effect of increasing the teaching time for Mathematics and English on the overall academic performance of learners.

The specific topic was no coincidence, but flowed from the outcomes of restructuring and realignment activities that The Foundation undertook at the time. One of its newly formulated focus areas was about how best to develop communication and analytical thinking skills among learners while at school. These two skills are assumed to play a great part in enabling learners to develop into economically active citizens, to make valuable contributions to society, and to ensure some level of personal wellbeing, hence The Foundation's support. In the project that got envisaged and established all along, an activity was found that gave shape to the support and the mentioned focus of The Foundation, as it dealt with learner performance in the learning areas of English and Mathematics. These two learning areas have been associated traditionally with the development of communication and analytical reasoning abilities.

During November 2006, the then CEO of The Foundation, Ms Zelda Holtzman, discussed the new strategic direction of the Shuttleworth Foundation with a senior Western Cape Education Department (WCED) official (Mr Ronnie Swartz), and mooted the possibility of working cooperatively and in partnership with them on future endeavours, such as what got named the 'PlusTime' demo/pilot project later.

The HSRC, on request, developed and submitted three research options (more about these below).

The Foundation then initiated discussions with Ms Lynette Maart, an independent consultant, who would serve as front-end project facilitator, with representatives from the Human Sciences Research Council (HSRC) as research service provider (Dr Cas Prinsloo and Dr Kathleen Heugh), and with the Education Management Development Centre (EMDC) Metropole-South (Mr Eugene Daniels and Mr Glen van Harte). In December 2006 the Director: Curriculum Development, Ms Jenny Rault-Smith, and the Head of the Research Division, Mr Peter Present, both of the provincial office of the WCED, also came on board.

Stakeholder meetings were held on 23 March 2007 and 13 April 2007. At these, detailed aspects related to research design, identification of experimental and control cohorts, data collection and the contractual agreements between the respective parties were discussed and finalised.

Up to this point the team concentrated very much on the conceptual frameworks and agreements. From April 2007 onwards, activities were moving towards implementation. Mr Milton van der Berg joined as Project Co-ordinator at the EMDC level. The project activities themselves then rapidly unfolded. These broadly included finalisation of the project and control schools, pre-tutorial learner assessment and collection of baseline contextual information (June 2007), preparation of the tuition materials, recruitment of tutors, setting the tutorial timetable, arranging catering for learners, delivery of the tutorial programme (July to November 2007), and conducting the post-tutorial assessment and information collection.

The second train of events started off as exploratory discussions between The Foundation and the HSRC, already as far back as December 2005. The first contact was direct talks in London between Mr Mark

Shuttleworth and Dr Vijay Reddy, the Executive Director (in acting capacity then) of the HSRC research programme responsible for research in education. As part of restructuring processes on the side of the HSRC, literacy and numeracy development studies were foregrounded even more than before. During the first half of 2006, HSRC researchers and Ms Zelda Holtzman of The Foundation met to start concretising initial ideas. Towards the end of 2006, the HSRC was invited to submit proposals and options that may address the needs of WCED, and align with the thematic thrusts or focus areas set out by The Foundation.

During December 2006, three options were proposed for discussion. These comprised exploring ways in which to enhance the contact-time that learners had for Mathematics and English, under the assumption that its extension would improve learners' performance. A first possibility was to design an intervention that would ensure that best/better use was made of existing time-tabled and gazetted time within the normal school day and curriculum (against wastage). A second option was to find ways to afford more time within the school day, without violating stipulations of school legislation and minimums required by law for any learning area, probably with School Governing Body (SGB) consent. A third was to extend contact-time into an after-school intervention or outside-school tuition programme. (Sub-options that had been discussed initially entailed variations such as peer- or community-teaching, supervised study, student outreach, etc.)

The first two options comprised many pitfalls, particularly related to human-resource management matters, labour aspects, school legislation, and potentially many other related sensitivities, and would require too much strategic and political intervention. They were, as a result, in the end abandoned in favour of the third option. In January 2007, The Foundation (CEO and trustees) expressed a firm interest in the after-school tutorial option. At this stage Ms Helen King (CEO of The Foundation) also became involved and particularly attended to matters related to getting the budget approved.

A process of tri-partite discussions was embarked on, that led to a budget being secured and agreement being reached on 27 February 2007 to undertake a joint piece of work. According to this consensus, a reasonably robust study, in the form of testing out a realistic, limited-scale demonstration project accompanied by an impact evaluation, would be undertaken. The rationale behind these various decisions was to keep interventions as realistic as possible within day-to-day school activities, to have its scientific scrutiny and tracking robust, and to leave opportunity early down the line to come to conclusions that would support making incremental decisions about adjustments, modifications, termination or further role out. (More detail follow all along below on the choices made in terms of study site, objectives and targets, sampling of participants, procedures, instruments, design and methodology.)

As a result, the study took on an almost action-research or trial-study approach, as the description as "demonstration" project would suggest, in an attempt to balance the many scientific and practical issues at stake better. This process would throughout comprise many research trade-offs between aspects such as the ones noted below:

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

1.1 Research ethics

The HSRC has a Research Ethics Committee (REC) that looks after the interests of research participants, especially within vulnerable populations and where procedures can cause any form of harm. To this effect, they have a monthly meeting, and require all research teams to submit a duly completed application form together with the project proposal, research instruments, information sheets and consent/assent forms for participants before research interactions are engaged in. The committee also requires confirmation of any official authorisation or permission that the client has to provide to the research team for working with the participants under their jurisdiction.

The existence and operations of the REC provide strong quality control over and protection for the work of the research team. To this effect, a toll-free complaints line number is also provided to every participant. As part

of the research procedures, every participant required to provide any information or responses to the team, received an information sheet, and had to sign off written consent for their participation before a researcher could engage with him/her. The parents of learners, who were minors still, had to also give their assent.

The provision of beneficial interventions to only some sites for at least a while was a slight concern at the outset. The Committee needed some undertaking that roll-out would occur more widely within a reasonable period should firm evidence come to light about the success of interventions (without jeopardising the design of the study and the ability to isolate or track the project cohort over time and compare its progress to that of the control group). It was explained to the Committee too that prioritisation and funding allocation processes within the WCED follow certain paths, which the research team could not in detail control. In terms of intra-departmental notions of legality and potential policy implications (the work would in a way touch upon policy implementation evaluation), the unions may also have questioned electing some schools for intervention and withholding the benefits from others, suggesting the importance of a robust and representative reference group and implementation network. One solution would also be to pursue rolling out to more/all sites any promising interventions as soon as findings could be considered robust.

1.2 Literature

There are widespread and firm indications from literature and theory that literacy underpins all further acquisition of concepts, meaning and knowledge. Popularly, two notions are used to express this (Heugh, 2006). In the first, children "learn to read". Thereafter, in the second instance, the acquired skills of reading (and listening, which later also envelope writing and speaking) become the instruments of further knowledge acquisition when learners "read to learn". These two sets of activities are obviously neither mutually exclusive nor completely sequential or serial. They are interactive, but along a course where the first is gradually accomplished more and more and at a decreasing pace as one reaches higher and higher levels of skill, while the second starts off slowly but accelerates as the tools for achieving it are becoming more and stronger.

Because the topic of language acquisition is of such a specialised nature, no attempt is made here to even try and locate the current study within the host of relevant theoretical positions and empirical findings that prevail. Suffice it to refer to a report currently being prepared, and soon to be released, about literacy teaching in a typical province of South Africa within the vast challenges of multi-cultural and multi-lingual literacy teaching strategies and policies, classroom practices, teacher-training factors and the availability and use of textbooks and other learning support material (Reeves, Heugh, *et al*., in progress). In this document, ample reference is made to the relevant literature, also with reference to the transfer of initial proficiencies to other learning area contents, and the resilience of early proficiency over time, at least into secondary school (also see Heugh, 2006).

Howie (2002) decisively argued and demonstrated that learners' proficiency in English explained a large part of the variance in their Mathematics performance scores. Interestingly language proficiency mattered more for Mathematics performance when the school's English proficiency levels were higher. (I.e., it appears as if proficiency in the test language (English in this case) becomes even more important when the challenges to master the contents of both Mathematics and Language are at their highest.) Additional to their own and their parents' perceptions about and attitudes towards Mathematics, general exposure to the language of the test, such as through radio, was also linked to higher performance. This study was based on the TIMSS-R data of 1998/99.

The linkages just mentioned exist in the current situation of a South African education system beset with problems and concerns pertaining to the overall low levels of performance in Mathematics and English. This fact is testified to by the latest rounds of results released from international comparative studies such as the Trends in International Mathematics and Science Study (TIMSS) and the Progress in International Reading Literacy Study (PIRLS) (Reddy, 2006a & 2006b; Howie, Venter, Van Staden, Zimmerman, Long, Scherman & Archer, 2007). Without providing further details about sources and references, it is open knowledge that these benchmarking exercises have been confirmed repeatedly by local systemic evaluations by the Department of Education at the levels of Grade 3 and 6, and other related unofficial (and non-national) evaluations and research studies at the Grade 8 and 9 levels. Adding recent matriculation and higher education figures and trends to these, also explains the prevalence of serious concerns about learner throughput into universities, especially with regard to Mathematics, Science and Technology candidates. Professor Mary

Metcalfe of the University of the Witwatersrand also recently (*Sunday Times*, 13 January 2008) provided some perspective on the enormous extent of the challenges pertaining to the latter issue.

Amongst a range of other factors, the issue of "time on task" has been raised repeatedly both as problem and solution to learner performance (Taylor & Vinjevold, 1999; Taylor, Muller & Vinjevold, 2003). Reeves and Muller (2005) also recently extended the contributions and debate in South Africa to the notion of "opportunity to learn" (OTL), for a while now receiving great attention internationally. They emphasised the dimensions of coverage of curriculum content, and the appropriateness of cognitive level (or progress across the curriculum across grade levels) in particular.

Some other factors, as alluded to in the previous paragraph, would include the socio-economic status of families, parental education levels, exposure to reading and writing opportunity in many ways, teacher pedagogy, assessment practices and feedback, facilities and learning materials, and including the quality and availability of textbooks, among many more.

A final reference to the inputs made by Prof Mary Metcalfe, Prega Govender and the other editorial contributions in the *Sunday Times* (13 January 2008) is considered appropriate. Ten key areas were identified in terms of how they contribute, with suggestions about how they could be addressed, with regard to school functioning. In them, the following matters are emphasised:

- Change and consensus building takes time, and all relevant relationships should be fostered deliberately.
- Teacher needs differ, and each should receive relevant opportunity to improve their mastery and confidence.
- Literacy and numeracy are the core(s) of learning, and practice and materials should be adjusted accordingly.
- Mistakes have been made about the languages of learning and teaching, and teacher training and materials should be addressed appropriately.
- Not enough resources have been invested, and school facilities should be upgraded in all earnest.
- Schools differ in their capacity and needs, and each should be engaged and supported appropriately.
- School and district leadership have been neglected and should be developed appropriately.
- Social and support mechanisms for teachers and schools have been neglected, and budgets, training and facilities should be improved (including libraries, psychologists, counselling, sport, etc.).
- The community base of education has been ruptured (in cities), and new ways of inclusive public schooling have to be developed.
- Planning has been poor, and consensus has to be reached about coordinated and long-term strategies and plans in an extremely complex environment.

From the few cursory references above the need for and sense behind investigating how to find extra time and effort to try and improve learner performance as much and as quickly as possible, is clear. If such a study could also establish more about the conditions under which expanding time for learning could or should take place, even better. As a result, there was considered to be much justification not only for undertaking the study as reported on hence, but also for many of the aspects of its conceptualisation. Above all, especially from the final ten points listed, it is clear that no quick-fixes should be expected.

1.3 Problem statement

A large majority of learners from public schools only have access to scant physical resources and suffer from impoverished living conditions at home. These conditions may often involve that learners do not have an own desk or workspace to work on, the absence of electricity, overcrowding (with many family members or families sharing small dwellings), not having enough paper and pencils, many interruptions which also entail having to do household chores, the absence of support and assistance with difficult parts of homework, etc. Such conditions (may) cumulatively prevent learners to master new knowledge contents presented during school time in the absence of affirming that with and extending it into repetition exercises through homework. This lowers the potential performance levels that they may otherwise easily have been able to obtain or maintain.

The core question is how one can find opportunity to amplify school-based work contents and rates through after- and outside-school tuition or assistance of some sort in order to improve learner performance when

school conditions themselves are bulging at the seems in terms of teacher capacity, workloads, facilities, classroom sizes, learning and teaching support materials, etc.

1.4 Rationale for the study

It is expected that if one uses means and ways to confirm and extend the initial transfer of knowledge and learning content during the formal/official school day to some formally structured outside-school mechanisms, one would be able to make significant gains in terms of learners' ability to master more (and more difficult) work in parallel to the normal within-school pacing and coverage of the curriculum and so increase their performance within a relatively short timeframe.

1.5 Hypotheses

Arranging structured opportunity outside formal within-school teaching and learning provision through mechanisms such as supervised homework or study sessions, peer-tuition, university-supported student outreach and community projects, or the like, should increase the ability of learners to master their regular school work as they go. Such assumed better mastery and understanding of subject contents among learners could easily lead to improvements in their performance of about 10 percentage points above a comparable class group within as little as a single year over the short term. (This target should be seen as a maximum, as other potentially important factors such as poor foundational knowledge among learners and/or the teachers' lack of understanding subject knowledge contents may still jeopardise the effect that interventions may have.)

In addition to having the expected more directly observable positive influence on learner achievement, a desirable side-effect (of tuition by someone other than the regular teacher) would most likely be to free up teacher time to prepare themselves better for teaching and to manage other important chores such as marking, giving feedback to learners, etc. (One should avoid allowing teachers to fall into the trap here of actually using such relaxation of immediately urgent responsibilities to avail themselves of more free time or time for extra-curricular or private tasks.) Any enhanced teaching ability could also contribute to the expected improvement in learner performance.

Although there had been some discussion beforehand about the potential benefits and disadvantages of having learners' own teachers serve as their additional tutors *vis-à-vis* the benefits and disadvantages associated with having other individuals serve as tutors, be they from within or outside schools, practical considerations led to a decision not to make use of tutors from outside schools. This limited the hypothesis that could be tested to just making a distinction between learners' own or another teacher serving as tutor. This aspect has to be explored in future studies, and it is discussed more at other points later in the report.

Generally: The sense of being involved in integrated and coordinated efforts from additional sources or sides may steer both learners and teachers towards a situation of confidence and increased impetus towards better achievement all round.[1]

[1] Note, however, that many inefficiencies could exist and remain from the sides of teachers, learners or the broader school system in terms of the effective use of normally scheduled classroom time within school hours, and these are not addressed automatically by providing for additional after-school tuition.

2

Design and methodology

In this section, the specific decisions made about the approach to the study, its design, the sample, the instruments used, and procedures followed, are briefly related and motivated against the backdrop of the more general formulation of the research problem, the rationale for studying it, and hypotheses formulated above.

2.1 The purpose and objectives of the study

The project steering committee and team set out to design the study in such a way that:

- it tests critical assumptions around Mathematics and language, especially in terms of the factors enhancing / detracting from learner performance
  (What would/could such factors potentially be? ---
  - good (or poor) teacher/teaching quality
  - good textbooks
  - time on task
  - quality time on task
  - homework practices
  - volume of own work (enough self-work)
  - conceptually sound feedback on tests, written and class work
  - teacher workload
  - teacher confidence
  - teacher organisation skills / classroom management
  - availability of learner and teacher support material (LTSM)
  - teacher creativity in the identification and use of LTSM
  - learner (and teacher) opportunity to read/write.)

- its scope is economical and practical

- its methodology is sound (reliable and valid measures)

- it allows limited-scale (i.e., simple, practical and cost-effective) pilot and demonstration work, the solutions of which should be up-scalable on success

- new, unique, simple, to-the-point interventions are developed to improve Mathematics and language teaching and learning.

In terms of the core objectives of The Shuttleworth Foundation, learners should be assisted to obtain and develop "curiosity about the world, and the tools to understand and shape the world".

Some of the wording reflected in the research and funding agreement shed some light on the intended goals and benefits of the study, and include the following:

> "The Shuttleworth Foundation (The Foundation) is prepared to make funding available for cost-effective research studies to find innovative solutions in order:
> (i) to improve learner performance;
> (ii) to test its own assumptions about the impact of increasing teaching and learning time for Mathematics and English;
> (iii) to translate the recommendations from such research studies into educational policy and to implement such recommended changes;

> The Western Cape Education Department (WCED) experiences a critical, ongoing and pervasive need to improve the success of teaching and learning under taxing operational circumstances pertaining mainly to:
>
> (i) the scores of learners without sound foundational knowledge (including the WCED's concerns about a high drop-out rate towards and after Grade 10 and poor throughput generally at the FET level);
> (ii) the large numbers of sometimes/often ill-equipped and unmotivated teachers;
> (iii) the situational conditions of ill-discipline and overpopulation in classrooms;
> (iv) the introduction of an additional learning area has further reduced time available for teaching/learning Mathematics and English;
>
> The Foundation, together with the WCED and the HSRC, agree to conduct the 'Time Plus' demo pilot research project to test some critical assumptions about the delivery of Mathematics and English – with the view to improve proficiency and grade results of learners in selected Western Cape high schools."

The scope of the project was further detailed as follows:

> "The HSRC agrees to conduct a one-year[2] (school calendar year 2007) 'PlusTime' demo/pilot research study which explores as its primary research question, whether Grade 8 learner performance in Mathematics, English and on the whole will improve by at least 10 percentage points, if more time is made available through after-schedule (-school) hours tutorial programmes, coordinated and facilitated by educators.
>
> In addition to the year-long study as contemplated …, and on condition that the WCED provides the necessary information, the HSRC agrees to compare the test results of the project and control cohort learners at the end of Grade 9 (in 2009) and Grade 12 (in 2011), …"

2.2 Approach to the study (design and methodology)

The best approach to the study was considered to be a very tight matched or paired control-group design. The scale of the study was also limited to a single school district in the Western Cape to be able to control external variance better, and to empirically pilot procedures under tight and limited control conditions before deciding on the implications of scaling up any possible interventions to more districts, provinces, or otherwise. For this purpose, a baseline survey of contextual factors and learner performance was undertaken at the outset in all 12 schools (see later for details on sampling).

Initial discussions at the time of setting up the study emphasised a number of aspects, which are briefly summarised next:

- Though processes, instruments and findings had to be reliable, valid and robust, this had to be demonstrated in a way that did not require full random or representative sampling and large-scale work.
- Therefore, a case-study, action-research approach was selected as more feasible.
- A longitudinal tracer component was also accepted in principle to allow investigating the sustainability of any project effects up to three or preferably five years after the event. A strong motivation for this was to isolate and overcome the initial Hawthorne effect, where improvement merely results from the attention of participation and being observed. However, sustainability over time is a critical success factor for the envisaged work.
- In order to control for the influence of the many possible conditions and factors falling outside the scope (and control, for that matter) of the study, matching/pairing each project school beforehand to a control school of similar size, location, performance level, and former department, for example, was anticipated.
- The collection of comparable learner marks before, during and after the study would be undertaken for comparison. To achieve this, national systemic evaluation scores, or additional province-wide information at Grade 9 and Grade 12 levels were especially targeted.

[2] The initial intention scheduled the tuition programme more evenly from about March/April to September, mainly covering Terms 2 and 3, but with contingencies it got condensed somewhat more from July to middle-November.

In the end, the following elements describe the study best:

- Matched/paired control(-group) design
- Sample (at institutional level) of convenience, but with "typical" representation
- From a single EMDC four control and four project schools volunteered
- Sample (at learner level): voluntary
- Pre- and post-tests as criterion measures
- Contextual background
- Difference-in-difference analysis
- Studying interactions from the side of contextual or contributing factors.

Figure 2.1 reflects the main design elements.

Figure 2.1: Simplified schematic view of the quasi-experimental study design

Group	Pre-tests	Intervention	Post-tests	Time lapse	Follow-up(s)
Control (C)	O_c		O_{1c}		O_{2c} (O_{3c})
Project (X)	O_x	X_1	O_{1x}		O_{2x}(O_{3x})

"Difference-in-difference" analyses were foreseen as the most helpful avenue to detect any effects of the interventions on the performance of learners. (This refers to the difference between subgroups' (C, X) difference scores from period O to O_1, or O to O_2, or O_1 to O_2.)

Figure 2.2 shows a more detailed simulation of how such analyses could unfold.

Figure 2.2: Illustrative schematic view of the result of difference-in-difference analysis

Baseline (Pre-test)	Intervention	Post-test 2007	Difference 1 (@ base)	Follow-up 1 in 2008	Difference 2 (@ base)	Follow-up 2 in 2011	Difference 3 (@ base)
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 b(aseline)		diff from b (+10 %pts)		diff from b (+10+ %pts)		diff from b (+10+ %pts)	
C (42)	No	C (45)	3	C (45)	3	C (37)	-5
	Diff-in-diff scores	(in %pts)	10		12		15

** MCQ = Multiple-choice questions/items*

Attention was also given to elements or steps that would give assurances towards reliability and validity with regard to instruments, procedures and conclusions, and the following can be listed:

- Semi-structured to formal training, intervention procedures, monitoring instruments, etc.
- Paired/matched design by school size, location, socio-economic context, and exposure to opportunity to read (learners and parents).
- Analysis of difference-in-difference scores between the performance improvements for the project- *vis-à-vis* the control-school groups from before to after the interventions.
- Repeated after-intervention follow-up and monitoring and performance measures to beyond the point where initial motivation levels would be expected to have dissipated.

Right at the outset of the process, a Steering Committee structure was established to manage the project. The funding organisation, The Foundation, appointed an independent consultant to serve as go-between for all the parties, and to synchronise activities, meetings, etc. Regular monthly meetings were held, preceded by the necessary progress reports from the key participants, where the project manager from Metropole-South EMDC, on behalf of the client, the consultant, and the project leader from the HSRC, were always present. In addition, representatives from the funding organisation and the provincial office of the WCED were in attendance as required. Besides this formal arrangement, any number of meetings and consultations took place in between as required.

2.3 Sample

The study was pitched at Grade 8 level, where it was hypothesised that there would still be an opportunity to remedy some of the gaps that had been assumed to exist in terms of the foundational conceptual knowledge of early high-school learners, before it became too late.

To keep costs and efforts manageable, sites had to be limited to about four to six (with a pair of schools eventually in each).

The following initial criteria were set for selecting these sites:
- no severe (i.e., almost completely debilitating) dysfunctionality[3]
- some stability of management and teaching conditions and staff turnover
- wanting to and showing commitment to participate (volunteer)
- School Governing Body (SGB) functioning intact and supportive / some minimum level of parental involvement
- some minimum literacy level among the parent community
- some reading opportunity and resources for parents and learners (community library, e.g.)
- not everyone at the lowest levels of performance (to avoid regression to the mean).

(In studies such as this, one can often consider an overlay of available GIS data, available by magisterial districts, school catchment areas, etc., to provide opportunity to further group by and analyse the effect of contextual and other demographic circumstances, such as crime rate, poverty, health services, etc.)

The four eventual pairs of control and project schools from EMDC Metropole-South had to reflect some spread across below- and above-average levels in terms of school size, location[4], and performance level, with the resulting target population showing the following characteristics:

- Small-size schools/classrooms:
  - 1x rural/township mid/poor performance level
  - 1x rural/township average to good performance

- Large-size schools/classrooms:
  - 1x rural/township mid/poor performance level
  - 1x rural/township average to good performance

The initial criteria set for the inclusion of schools were:
- secondary schools with Grade 8 to 12
- schools not (severely) dysfunctional
- above certain minimum level of parental involvement
- volunteer/motivated
- intact classes
- average to large class sizes (25-50 learners) as maximum
- well-staffed (continuity and some minimum professional qualifications and experience)
- commence with Grade 8/9 (new implementation of NCS in 2007, then trace over next years only in this cohort).

The underlying principles that indicated the abovementioned approach to the selection of school sites (including indications for largely involving township schools) were:
- relevance (where the problem is experienced widely)
- comparability (selection/description of matched/paired project/control schools design)
- generalisability (selection of project schools as typical of 60% or more of those in the province).

In the matched control schools, no interventions would take place, at least not during the parallel experimental periods.[5] A final matter that was settled at this point, was not to involve learners inside the schools, where

[3] This exact meaning of this term is contested, first in the sense that it is not necessarily used as a formal classification category in the EMDC or WCED, and second, in that various degrees and areas of inefficiency may apply.
[4] Given the intention of the project to benefit the typical school in WCED Metropole South, the formal city "suburb" layer, deliberately also avoiding ex-Model C schools, could be removed for school location (thus working only in former townships/small towns), which reduced the sample to four school pairs, instead of the eight otherwise indicated.

some other would undergo the tutorial programme, as controls, as any spill-over effect from tutors, teachers or project learners to control learners would so compromise the isolation of tuition effects that the study would become worthless.

2.4 Procedures

2.4.1 Development of the tutorial contents

An initial decision to appoint Mr Johnny Freeze as project manager from the side of EMDC Metropole-South was revoked very early on, and Mr Milton van der Berg was appointed in this capacity for the duration of the study. Information for this and the next sub-sections was provided by him. He also supervised the development of the tutorial materials, as well as the recruitment of tutors.

The biggest challenge here was ensuring that the material was pitched at an appropriate level for most of the learners. Since schools generally experience serious problems with Numeracy and Literacy, many learners currently in Grade 8 do not display the numeracy and literacy levels associated with a typical Grade 8 learner. This implied that certain content materials considered to be pre-knowledge at the Grade 7 and even sometimes Grade 6 level, were also included.

Mathematics

One of the curriculum advisers for Mathematics at the district office accepted the responsibility for developing the tutorial material for the learning area. He was guided by the requirements spelt out in the NCS (National Curriculum Statements) but also by what he perceived through school visits to have been aspects that required additional attention.

The idea was that these concepts would be taught in the normal school periods and that it would be reinforced in the tutorial sessions. This however did not always work out in reality since some of the aspects touched on in the tutorials were not covered in class by the time learners had to deal with the tutorial. This situation made it significantly more difficult for learners to cope with the demands of the tutorial contents.

English Home Language

Only two of the project schools offer English at this level. The material for this learning area was developed by four teachers, two of whom became tutors as well. All four of them have extensive experience in the learning area.

The fact that by far the majority of the learners that do English as a Home Language are in fact not mother-tongue speakers of the language was an aspect to be considered in the design of the materials. The developers were further guided by the requirements of the NCS and pitched the contents at a level that they, through their experience, deemed to be at Home Language level.

English First Additional Language

All four the project schools offer English at this level. However, as pointed out earlier, many of the learners suffer an English literacy deficit, in some cases quite seriously so. Many of these learners are to be found in this group.

Four experienced teachers, one who also became a tutor, had the responsibility of designing the material for this group of learners. It is especially in this group where one would find massive discrepancies in terms of ability and where as a consequence it was quite challenging to meet the needs of most of the learners. This group of learners struggled severely in the pre- and post-tests since the tests were only available at home-language level, which presented quite a challenge to learners functioning at an English Additional Language level.

[5] However, the labour action (public sector and teacher strike) resulted in a recovery plan being implemented everywhere. Its potential effect is discussed in the concluding sections of the report.

A consistent element during the development of the materials was to compile a session worksheet, that would fit into 60 minutes, comprising the introduction of a theme/topic, and some group or individual assignment. It would sometimes imply that learners had to complete an exercise afterwards. Various lessons made provision for various modes of learner participation, such as open discussion, constructions, completing exercises, making presentations, etc.

2.4.2 The recruitment of tutors

Initial debates centered around the benefits for standardisation and quality of the tutorial contents should externally-recruited tutors be employed. This was pitted against greater workability when tutors come from within schools, irrespective of whether they were the learners' own day-to-day teachers in the classroom or not. Outside tutors, again, may also have become prohibitively expensive.

A more detailed summary of the course followed was provided by Mr Milton van der Berg, and follows immediately below.

Tutors at each of the four project schools were drawn from the ranks of the staff. They were Mathematics and English teachers who volunteered to teach the tutorials in the afternoons after having been through a normal school day.

An attempt was made to attract experienced, retired teachers and teachers at other schools to act as tutors, but none were available. This meant that most of the learners in the project received tuition from the teachers who were also responsible for teaching those subjects during normal school hours. If those learners were experiencing sub-standard teaching in their normal school programme they would experience more of the same in the tuition programme. This factor would have a negative impact on the amount of progress they were expected to make by being in the programme.

Incentives

Since the project centred on extra tuition after school, tutors demanded that they be remunerated for having to teach for an additional hour after school and for taking care of the related administrative responsibilities.

The district office decided to make available R80,00 per session (covering two hours of activity) as some form of reward to tutors. This decision was preceded by some debate as to whether teachers should be paid for working extra hours and also what cost implications remuneration would have if the project was going to be rolled out to scale.

Even though tutors weren't too happy with the offer they decided to commit themselves to the project. It was further agreed that they would receive the money at the completion of the tutorial programme.

Tutor preparation

The plan was to put tutors through some form of preparation to run the tutorials. A number of sessions were envisaged, but due to time constraints, mainly caused by the teachers' strike, this had to be aborted. Only one session to prepare the tutors for their responsibilities took place in the end. The session focused on the expectations we had of them as Project Coordinators. In addition, the material developers were given an opportunity to guide the tutors through their material.

After the whole event, a decision was also reached, as a one-off token of gratitude by the Department, and with the stipulation of some requirements for their use, that laptop computers would be made available to the tutors who completed their participation in the study.

2.4.3 Baseline administration of learner performance assessment and contextual survey instruments

At the outset, during two briefing / training sessions, both the officials from Metropole-South EMDC and the staff from the participating schools (principals, coordinators and teachers) were informed about and trained to administer the performance tests, as well as the parent, learner, teacher and other background questionnaires.

During this process, the HSRC research team also supervised the batching of research instruments and materials, did the training, and also undertook site visits (school-level observations and principal interviews), classroom observations and teacher/tutor interviews (with some exceptions due to absences on the day.)

The training process was accompanied by a detailed administration "manual" that stipulated every requirement and attempted to standardise the procedures as much as possible.

During the project, the HSRC team paid site visits on two further occasions to monitor conditions and the delivery of the tutorial sessions. This served a broader quality assurance purpose, and comprised information collection to familiarise the team about implementation conditions on site.

The instrument administration procedures are reflected in Annexure 1.

In addition to these steps, the appointment of the full-time internal project manager in the EMDC Metropole-South offices by the Department, and the payment that The Foundation made available for a replacement person for the duration of the work, contributed much to the operational success of the study.

The baseline learner assessment was completed just in time before the teacher strike took effect, which then delayed the onset of the tutorial programme implementation until after the winter holidays in July 2006.

2.4.4 Implementation of the tutorial programme

The tuition programme materials for 20 hours were rolled out in each of the learning areas of English and Mathematics. Learners could volunteer to become involved in various arrangements in either or both English language, and/or Mathematics (in either Afrikaans or English as language of instruction).

Other than initially considered[6], learners did not undergo tuition as intact classes. The volunteering learners were divided into their relevant groups depending on the learning areas they had indicated. Group size, however, was required to create an advantage above normal day-time teaching, by reducing the teacher:learner ratio. As a result, the maximum size was limited to 25 learners or fewer. This would foster more favourable conditions and opportunity for individual attention to learners when required.

The teacher strike resulted in the schedule being reworked, and special permission was obtained to extend the completion of the programme into the fourth term (early November 2007).

In the process, one intended project school did not see its way open any longer to participate. It was replaced by an intended control school, which at short notice, and inevitably with some delay in keeping pace with the rest, completed their sessions slightly behind the rest.

The project right from the outset made provision, through an additional budget provided by The Foundation, to provide learners, who stayed behind at school for an afternoon per week per learning area in which they participated, with a light meal / sandwiches to enable them to undergo the tutorial sessions without becoming hungry and being thus distracted. Assurances were also solicited from the schools that they would apply normal steps with regard to supervision, and the safety and transport arrangements of learners, as for any other extra-curricular event.

The tutors and school coordinators were required to keep a complete record of the contents of each session, as well as an attendance record of every learner per session. The tutorial contents worksheet made provision for recording the nature of activities engaged in during the session according to the following rubrics:

- name of tutor
- date
- duration of session
- number of learners present
- learning area and learning outcomes (for Mathematics: Numbers, Algebra, Shapes/Space, Measurement, and Data; for English: Listening, Speaking, Reading/Viewing, Writing, Thinking/Reasoning, Grammar/ Vocabulary)

[6] When it was still an option to have one class as tuition group and another matched one from the same school as control.

- topic or theme of the lesson
- specific problem area
- grade level of the contents
- teaching methodology (exercises, team projects, whole-class teaching, etc.)
- textbook used or not (and title, if used)
- other LTSMs used (for Mathematics: calculator, Mathematics set, wall charts, real-life objects, magazine clippings, etc.; for English: dictionary, wall charts, newspapers, magazine clippings, etc.)
- assesssment approach (for example, continuous, test, home exercises, classwork, etc.)
- learner motivation (all learners enthusiastic, most learners positive, average commitment, most learners lethargic/passive, almost all learners lack enthusiasm).

At especially two of the schools learners seemed to have struggled to work through the tutorials in the allotted time. This resulted in many tutorials requiring more than the one-hour session dedicated to it. More sessions had to be organised so that all the tutorials at those schools could be covered; an indication that many learners found it challenging to cope with the degree of difficulty of some of the tutorials.

2.4.5 Matching of groups

On the basis of available contextual information about the schools, classrooms, teachers, learners and the parent community, four project and four control schools were paired or matched to control non-systematic influences. The outcome of this activity is discussed in more detail in Section 3.1.

2.4.6 Post-intervention learner assessment

The participating learners from the four control and four project schools were again assessed by means of a post-test in English and Mathematics. Analyses could then be conducted of the difference in the anticipated performance improvements between learners from the two groups, and the influence of a number of factors on this, including tuition-attendance levels, reading opportunity at home, etc.

Two delayed post-tests (one at the end of Grade 9, and the other at the end of Grade 12), are required (envisaged) hereafter to confirm the sustainability of intervention effects, and to rule out falling back to old ways as soon as the interventions stop. A decision has been taken to make use in this case of common exit-exam marks from the system itself as provided by the Department.

2.5 Instruments

An instrument grid was developed beforehand to specify the information that had to be collected, and the source(s) from and the mode(s) through which it had to be obtained. This grid also guided the instrument development. This process was done in collaboration with the steering group comprising representatives from the Metropole-South EMDC and WCED provincial office, the funder, the research organisation, and the independent consultant, as required. A short summary is given of what this entailed.

Demographic and baseline contextual information

- WCED CEMIS system (for follow-up tracking): learner EMIS number, home language, official language of learning and teaching (LOLT), preferred language, socio-economic status (SES) indicator (school-fee or assistance grant, poverty index of school), repeat or promotion records, core learning area performance marks (Grade 9 to 12 in Mathematics, Language, Life Orientation).
- School-level observation: Condition and functionality of school.
- School principal questionnaire/interview: Mathematics and Language teacher and learner numbers and pass rates per year group, time-tables, teacher qualifications and experience, class sizes, poverty index, time usage dynamics/reasons, strategies and policies for time use, facilities, venue for tuition, learning support materials.
- Teacher questionnaire: learning-area appropriate experience and qualifications, training, home language, motivation / attitudes / job satisfaction, number and size of classes / learning areas.
- Teacher document review: assessment quality, curriculum coverage.
- Some classroom observation.

- Learner questionnaire: books at home, library / reading opportunity, magazines and newspapers, TV viewing, home language, previous core marks for Grade 7, interest in work, homework space (desk), attitudes, commitment, career plans, access to school, other tuition and support.
- Learner document review: assessment quality (portfolios).
- Parent questionnaire: books & reading, home language, SES, qualifications, access and mobility, writing opportunity, support of learners, involvement in school and learners' work, ideals.
- Tutor questionnaire: qualifications, experience, learning area, age, etc.
- Learner performance marks: CEMIS as above, learner marks in Grade 7, Grade 8 multiple-choice questions (MCQ) Mathematics test, Grade 8 MCQ English Language test, Grade 9 exit marks (common tasks of assessment or CTAs), Grade 12 marks.
- Tuition contents: MS Excel spreadsheet with Sessions 1-20 in columns, and various information fields in rows (as already listed).
- Tuition attendance: MS Excel spreadsheet with sessions / dates 1-20 in columns and learner attendance records in rows.

3

Sampling outcomes

In this section, two aspects are reported on. The first is the outcomes of the exercise to match control and project schools, and the second, the frequency distributions pertaining to completed instruments, or a description of the sample that was realised.

3.1 Matching / pairing project and control schools

As alluded to elsewhere, the delays that came to pass because of the teacher strike towards the end of the second term resulted in the late start of the tuition programme, as well as some complications pertaining to the retrieval of all the baseline information. It also has to be noted that it was not only the mere fact of retrieval of the mentioned information that had to be waited for, but also the completion of data capture and cleaning, before such empirical analyses could commence. Fortunately, the administration of learner performance tests and contextual questionnaires had not been jeopardised to any extent that would invalidate the baseline picture. The consequence of this delay was that a slightly different process of conceptual matching of schools was done provisionally, followed by a two-stage empirical verification, as the information became available. It meant that based on the detailed knowledge of the EMDC project manager of the nature and operations of the 12 participating schools at that point (four project and eight intended potential control schools), a provisional matching could be made. The final matching turned out to be the following:

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

Aloe Junior High came on board right at the last moment as control school when Sibelius Secondary had to withdraw as project school for reasons of workload, also pertaining to the recovery programme after the July holidays. That moved Fairmount into the project group, and Crestway into the control group at the time, but the latter also had to withdraw soon (and was replaced by Aloe). The original three extra control schools, with an additional replacement school, as a result left Crestway, New Eisleben, Lower Crossroads and Glendale out of the further activities once they had participated at the baseline for the sake of oversampling to make it possible to achieve a close match or pairing between each project school and its control school.

The Steering Committee was kept abreast of developments throughout, and participated in decisions all along. This section of the report is based on the two special progress reports compiled in this regard.

First stage of verification of matching of control and project schools as at 23 November 2007

As explained above, some delays were experienced in receiving back all the baseline test booklets and questionnaires completed by learners and parents from all 12 schools. This made linking the four instruments per learner (Mathematics test, English test, learner questionnaire and parent questionnaire) in time to determine whom the post-tuition testing should be administered to, impossible. Data preparation, capturing and cleaning would not have been completed in time to wrap up the second learner testing exercise before the end of the school year. Therefore, instead of relying on the details of empirically analysing the socio-economic status of learners and parents, and other socio-contextual factors such as reading opportunity, parental employment profiles, and others, another procedure was followed.

This entailed a process of informed consultation with the Metropole-South project manager, the school principals and teachers through him, and other district staff knowledgeable about conditions and circumstances at schools. Thereafter, conceptual matching was done at this stage, with the outcome as

reflected below. This outcome would be confirmed later through the empirical means and data at the disposal of the project team, as soon as that would become available. Should any deviations, which would be small, if any, between the conceptual and empirical matching outlined above have been discovered then, the eventual project findings would be interpreted in that light for the few schools or single pairs potentially affected.

Once the schools had been provisionally matched, preparations for printing the materials for the post-tuition Mathematics and English testing on 20 November 2007 got underway.

Data preparation and manual linking (of the various instruments for each learner) were completed in the meantime at the end of the first full week of November, and capturing commenced on 12 November 2007. The latter was completed during Week 3 of November, after which data cleaning and integrity checking had to take place, as well as marking the tests electronically, before analysis could start.

The detailed classlists per subject and school had been supplied already to the district project manager to enable preparing for the administration of the correct instruments to have as close as possible to a full set of matched pre- and post-tests for each learner to enable the calculation later of the difference-in-difference performance scores, supposedly yielded by undergoing or not undergoing the tuition programme.

The status after the first stage of matching on 23 November 2007 is reported next, and also documented in the first set of tables in Annexure 2. The tables summarise observations made about key functionality constructs from the school- and classroom-level observation schedules, as well as the teacher questionnaires, retrieved first from the baseline survey. It has to be noted that completion and/or return rates were not good at all, especially for the latter. An indication is provided further below of the extent of this situation. However, given the mix of variables that could be looked at, and the resulting almost infinite configurations of comparison that could be constructed, one could not have hoped to really do better than shown below, and especially not to improve on the conceptual pairing that was done in a preliminary way already, as suggested by well-informed officials and staff within the WCED. A final note concerns the fact that a few key aspects such as exposure to reading opportunity, the general socio-economic status of families, and parents' qualification levels and employment status still had to be inspected as soon as the data from the Parent and Learner Questionnaires, which were expected any day at that point, had been received.

General conclusion (after the first stage of matching)

The few existing, and not so large, class-size differences could not have been eradicated by matching to some of the hitherto discarded control schools.

In terms of most of the conditions, discipline, learner performance and curriculum management indicators considered, retaining any of the discarded control schools instead would not have improved any pairings, especially for Pairs 3 and 4, and also in terms of the Mathematics classroom profiles. Put differently, only here and there for English classrooms, and perhaps for Pair 1 more so, some better matches could be achieved. However, affecting that would lead to making some desired gains, but also again at the same time misaligning other aspects.

With regard to issues related to assessment practices, it again is only for the two schools in Pair 1 for English classroom conditions where the project school and control school could have been matched a bit better perhaps.

It also has to be noted that the number of observations were very low throughout, resulting in frequencies of one and two in many cells in the contingency tables constructed. This implies that very slight shifts would alter the call about matches or pairings being strong, decent, fair or poor.

(Here and there data gaps (poor completion and low return rates) even made comparisons impossible altogether, sometimes merely because of insufficiently overlapping information on individual variables. This situation particularly applied to the Teacher Questionnaire information on aspects such as qualification level, experience in years, workload, assessment practices, career aspirations, time use, and provision of extra classes to learners.)

A brief summary is made below of gaps in the return of information that had to be accepted at that point:

- Fairmount (replacement project school): no information yet.
- School-level observation – all the rest complete.
- Classroom-level observation – samples of practice were completed for often two, but at least one classroom per each of both the Mathematics and English learning areas for all schools, with the single exceptions being Fairmount (as above), and Glendale (Mathematics only – and it was a discarded control school at that stage anyway).
- Teacher questionnaires – rather more incomplete completion and returns, especially for Ocean View, Intsebenziswano, Aloe, and Phakama existed (considering only currently selected or paired project and control schools). [It did not make sense to pursue additional coverage actively, as the main part of the analysis, given the rather small sample of 8 schools, and at most about 40 teachers, would centre around linking the learner performance pre- and post-test scores through the interpretation of parental and learner contextual circumstances, and the tuition coverage / or not.]

Overall recommendation after the first stage of matching:

That the pairings be accepted as they stood, but to inspect as soon as possible the Parent and Learner Questionnaire information for any large mismatches regarding parental and learner profiles in terms of key aspects of socio-economic status and literacy.

Second stage of verification of matching of control and project schools as at 3 December 2007

Without having gone into the details of comparisons in the same way per individual pair as with the potential school and classroom/teacher background factors, as in the summary tables for the first set of comparisons, notes are provided below (and in the second set of tables in Annexure 2) to focus on and highlight matters related to the socio-economic and employment profiles, qualification levels, as well as opportunity to read, as these pertain to the learners and their parents from the various schools.

It has to be noted that completion/return rates again limited some comparisons to a certain extent. However, in a broader / overall sense, much less variance were observed between the learners and the parent communities from the various intended pairs of schools, compared to potential teacher and classroom factors. Also, current control schools outside the envisaged pairs would consistently not provide better pairings. If anything, by including some such control schools, mismatches were only likely to increase.

As a result, one could not hope to improve much, especially without sacrificing other good matchings, on the conceptual pairing done beforehand, as supported so far by the school-, classroom- and teacher-profiling data, and the proposed pairings were thereby even more strongly confirmed.

[As before, more than a 12 to 15 percentage-points difference between control and project schools in terms of the frequencies of respondents within any given response option was taken as indicative of a difference in profiling (i.e., mismatches of average to sometimes larger extent). Where some mean scores could be calculated, e.g., time spent on work, the standard deviation (SD) was looked at, with differences very seldom even reaching 0,1 SD, which is much lower than the 0,25 to 0,33 of an SD often used as a rule of thumb.]

General conclusion (after the second stage of matching)

The few exceptions noted in the right-hand column of the second set of tables in Annexure 2, and especially the lack of opportunity to make improved matches from the hitherto provisionally discarded control schools, warranted abiding by the *a priori* matching decided on.

In addition to the conditions, discipline, learner performance and curriculum management indicators considered from the classroom level, the socio-economic, qualification, employment, reading opportunity, and time usage factors at learner and home level also only produced large overlap and limited exceptions.

(Here and there data gaps (poor completion and low return rates) continued to make comparisons impossible.)

At that stage, the only gaps in returns and retrievals of materials pertained to the following:
- Low/late returns in Learner and Parent Questionnaires for Fairmount (replacement project school) and Vuyiseka project schools limited the information required to do many of the comparisons on which

matching decisions would have been based more empirically. However, nothing thus far suggested any concern about the pairings.

Overall recommendation in the end

That the current four pairs be accepted as the best possible matches that could have been made. This recommendation was deemed to be supported and justified by the absence of any substantive information on serious mismatches coming from the added analyses based on the parental and learner profiles in terms of the key aspects investigated for the respective control and project school pairs.

3.2 Sample realisation

Although quite a number of discontinuities still existed in the end, owing to practical realities, among learners in as far as the completion of full sets of instruments are concerned, Table 3.1 provides a headcount of the overall numbers of participants in the learner performance assessment testing.

Table 3.1: Numbers of learners who completed performance assessment instruments across learning areas and stages of testing

		Participated in English pre- and post-test		
		No	**Yes**	**Row totals**
Participated in Mathematics pre- and post-test	**No**	213	166	379
	Yes	176	219	395
	Column totals	389	385	774

It has to be noted that the figures reflected in Table 3.1 suggests three layers of potential analyses, being:

- Strict (joint) modelling on the just more than 200 (219) learners who participated in the tuition programmes for both learning areas and for whom pre- and post-test data are available (including tuition attendance records for the project-school learners)
- Modelling separately by learning area (Mathematics and English) for the almost 400 learners (395 and 385 respectively) who for the subject wrote both the pre- and post-tests, and for whom tuition attendance records are available
- The larger number, in various configurations, of almost 800 learners (774) for whom at least some information is available that would allow uni-layered analyses, correlations, etc, between contextual and performance information.

With regard to the test completion per research group (project and control), and per learning area and stage of testing, the individual frequencies as reflected in Table 3.2 materialised.

(The total numbers of participating learners, for whom any or at least one item had been recovered, appear in the left columns of the difference-in-difference analysis tables in Section 4.)

Table 3.2: Numbers of learners who completed* performance assessment instruments across research groups, learning areas and stages of testing

Research group	Phases / sub-groups	Mathematics pre-testing	Mathematics post-testing	English pre-testing	English post-testing
Project schools	**Paired testing**	148	148	193	193
	All tests	247 (45=Afr)	187 (25=Afr)	268	213
Control schools	**Paired testing**	247	247	192	192
	All tests	303 (57=Afr)	251 (49=Afr)	301	197

* All instruments were completed in English, unless otherwise stated (Afr = Afrikaans).

It has to be noted that attrition from pre- to post-testing mostly was in excess of 50, leading to a reduction in the number of learners for whom paired pre- and post-testing combinations remained in the dataset.

Also, large equivalence existed between the numbers of project and control respondents for the various learning areas and testing stages, especially for English.

Interestingly enough, girl students are over-represented, a fact that may have something to do with more altruistic behaviour, ambition, etc., among females, thus having lead more of them to volunteer their participation? Be it as it may, for the overall group of 774 learners, 42,4% (328) were male and 57,6% (446) female. For the project group, where the altruistic trend may have come out even sharper, 40,5% (145) and 59,5% (213) respectively of the total number of 358 learners were male and female. For the control group, the difference was less pronounced, with 44,0% (183) and 56,0% (233) respectively of the total number of 416 learners male and female.

As to home language, as indicated by the learners themselves on the learner questionnaire, with records where possible verified and updated from other sources (tests, or parent questionnaires) just over one-fifth of the group (21,6%) were Afrikaans-speaking, with just over a quarter (25,9%) English-speaking. Just more than half (51,3%) spoke isiXhosa at home, with very few (1,2%) having other home languages.

Parent questionnaires were mostly completed by the mothers of the learners (in almost 70% of the cases). Fathers did this in just fewer than 20% of the cases. The remainder of completion was taken care of either by grandparents (3%), uncles or aunts (3%), elder siblings (6%) or other caregivers (3%).

With regard to the qualification levels of parents, in the case of male parents (or caregivers), almost half of them completed at least primary school. This figure was lower, at just about 40%, for female parents (caregivers). An additional third completed Grade 9 (including some pre-matric certificates) among the males, but this figure was closer to 40% for females. Of the remaining about 20% who completed matric, for both sexes, almost 7% of males completed some post-matric qualifications, while this was lower for female parents / caregivers at about 5%.

The birthdate frequency distribution shows the typical school age being to have turned 14 in 2007 in Grade 8 (born in 1993), with some 60% belonging there. An additional 22% of learners already turned 15 in Grade 8 in 2007 (born in 1992). There were about 4 % very over-aged learners (born 1988 to 1990, or turning 17 to 19 in 2007), and some 8% turned 16 (born in 1991). At the younger end (of going to school early), about 6% of learners were born in 1994 and turned 13 in the research year, with a few execptions (4 learners) even turning just 12 (birthdate 1995).

As to the returned contextual questionnaires, the frequencies are as in Tables 3.3 and 3.4.

Table 3.3: Frequencies of learner questionnaires retrieved

Language of completion	Project schools	Control schools	Total
Afrikaans	48	45	93
English	247	216	463
Total	295	261	556

Table 3.4: Frequencies of parent questionnaires retrieved

Language of completion	Project schools	Control schools	Total
Afrikaans	48	49	97
English	49	76	125
isiXhosa	113	127	240
Total	210	252	462

For about 100 learners there were no returns of parent questionnaires, signalling the difficulties of communication between schools and homes, and getting parents, learners and staff so far as to comply with requests for assistance.

Also, more than half of the parents took the opportunity to complete the short questionnaire that had been supplied in the vernacular, in retrospect a very good decision that would have enhanced the retrieval and reliability of contextual information about home conditions.

The frequencies of instruments retrieved from schools and teachers are reported in Table 3.5.

Table 3.5: Frequencies of school, tutor and teachers questionnaires retrieved

Instrument	Project schools	Control schools	Total
School review / principal	3	4	7
Mathematics Tutors	8	-	8
English Tutors	11	-	11
Mathematics teachers	6	6	12
English teachers	8	4	12

4

Findings

In this section, the observations and findings are reported in separate sections as they relate to the contextual profiles underpinning learners' performance, tuition programme implementation and attendance, baseline and post-project assessment levels of learner performance, the difference-in-difference analysis on the impact of the tutorial programme, and the effects that contextual variables had on learners' performance improvement over time, given their participation or not in the tutorial programme.

4.1 Contextual profiles in terms of school, classroom, teacher, own and parental background

Many potential factors could have a bearing on learners' school performance as such, and also the extent to which the project learners could improve their performance on receiving extra tuition. These contextual variables are briefly introduced in this section through reporting the responses of the various participants.

4.1.1 Learner context

Inspecting responses of learners as recorded on their completed learner questionnaires, portrays the typical, unique or otherwise interesting observations as discussed in this sub-section. Salient aspects were considered throughout for use in the subsequent analyses to determine whether they would affect learner performance differentially. One has to note that sufficient variance had to be present to allow enough responses across all options to be able to detect any impacts.[7]) As noted earlier, 556 questionnaires were completed in total, of which 93 were in Afrikaans.

Access to school

The following three observations make it clear that learners from all the schools reported relatively high levels of physical access to schools:

- Most learners (almost 85%) got to school by foot, with just over 9%, in roughly equal proportions, getting there by train or taxi. Not even 3% each either got taken there by their parents in the family car, or by getting a lift from someone else. About 1% rode to school by bicycle.
- It took most of the learners (44% of them) under 10 minutes to get to school. Another fairly large group (36%) reached school within 10 to 30 minutes. For almost 16% it took up to an hour, and for just over 4% more than an hour. These four time-brackets roughly translate into the same proportions of learners living within a kilometer, two kilometers, four to five kilometers, or more than five from school.
- Late coming at a frequency of "once a week or more" was self-reported in fewer than 20% of the cases. For the remainder, coming late for school once or twice a month occurred in fewer than 15% of the cases, and no late coming in two-thirds.

Primary school results

Learners somewhat battled remembering or having access to their Grade 7 marks of the previous year, as the response rates show. Only between three and four of every five learners for whom a mark in Mathematics or English performance became available during the study, could supply their corresponding Grade 7 performance percentages. These, nevertheless, reflect the following:

[7] Also, to keep reporting simple and flowing, not all frequencies and percentages are reported in detail for all available response options. However, care has been taken throughout to report only meaningful trends and information, also in cases where response rates were high enough (i.e., missing values were not more than 15% or so).

- The mean scores provided by project-school learners were in the vicinity (within 1,5 %-points) of 65% for their Grade 7 performance in Mathematics, English and Life Orientation.
- For control-school learners, the corresponding mean scores were close to (same 1,5 %-point distance) 59%.

English consistently comprised the relatively lower scores, as did project and control schools from Pairs 1 and 4. (The control school from Pair 3 also did not perform that high.)

Facilities at home (socio-economic status indicators)

Information was also collected on a number of aspects that could serve as proxies for socio-economic status, or could act as factors hindering or enhancing learner performance. Among the many observations, the following were most salient:

- By far the majority of learners (rounded percentages follow in brackets each time) were from homes where tapped water (86%), flushing toilets (about 92%), electricity (about 98%), fridges (about 90%) and television sets (95%) were the norm. Only 11% and just over 25% respectively, though, had access to PCs and/or satellite television.
- Almost 60% of the learners shared their bedroom with at least one more person (not interrogated further), but assumedly ranging from another sibling, to more members of the family and extended family in communal room arrangements. Three-quarters of the learners did have there own bed to sleep in, though.

Opportunity to literacy, reading and learning

Responses ranged through the following, and indicate a lack of reading culture, generally speaking, not necessarily in the absence of opportunity altogether:

- Limiting books to exclude school text books, library books, magazines and newspapers, 28% of learners indicated that they did not have any books of their own. Fifty-five percent only had between 1 and 10 books, 11% had 11 to 20 books, and 5% had more than 20 books.
- The picture remained very much the same for books belonging to any other persons in the home, with the figure for no books increasing to about 34%.
- While 17% of the learners reported reading newspapers every day, and another 40% once a week or more, 14% read such only periodically (every two weeks), 17% seldom (once a month), and 11% never.
- The trends for reading magazines did not vary much more than two %-points from those above.
- A library was reported to be within walking distance from learners' homes in 80% of the cases. Learners did not know where the library was in only 4% of the cases. In 5% more of the cases, they could get to a library within 30 minutes using some kind of transport, although it would take longer than 30 minutes in the cases of another 10% of the learners.
- Visits to such a library occurred daily (8%) or weekly (37%) in the cases of almost half of the learners. However, besides the 17% who reported visiting a library once every two to three weeks, 31% visited the library once a month or fewer, and 6% never.
- Learners could do their homework at a table in just over 60% of the cases (own desk or table – 28%, shared table – 23%, and family's dinner table – 14%). While 19% reported doing their homework on the floor, 16% said they completed it at school before getting home.
- Studying for tests and exams took place most of the time on learners' own beds (48%). Apart from the 22% reporting that they used another couch somewhere, 4% said they studied on the floor. In the case of 17% of the learners, they had their own desk. For 7%, they had to share a desk, and for 2%, used the dinner table.

Time use at home

Although there seems to have been some confusion about calculating and completing the various items, or the effort was too much, the following appears to have been the average times spent in minutes[8] by learners on various activities during the course of a week, also including weekends:

[8] Some exploratory calculations were made to establish the effect of removing a few outliers from the top and from the bottom ends, respectively, of the distribution, to exclude potentially implausible responses, which may have resulted either from learners noting hours instead of minutes, at the lower end, or weekly totals instead of average daily figures, at the high end of the scale. All in all, deviations of mean scores appear not to exceed 10 minutes in most cases. As a result,

	On a typical weekday	During the weekend in total
Mathematics work	42 min	28 min
English language work	48 min	43 min
Other subjects	80 min	60 min
Watching TV	151 min	224 min
Reading	67 min	63 min
Playing with / visiting friends	136 min	206 min
Buying groceries / food	62 min	104 min
Doing home tasks	90 min	109 min
Doing paid part-time work	72 min	109 min

The figures do suggest, though, that the typical learner may on a weekday stay up till late at night (after having spent almost three hours on school work, watched TV for two and a half hours, socialised with friends for two hours, read for an hour, and done shopping, home chores and even paid work of an hour each. Some of the activities may also flow into each other and overlap (e.g., reading, schoolwork, having friends around), and there may have been a halo effect (inflated reporting) for socially desirable activities. Both of these would reduce the reported durations somewhat.

For weekend time, should one convert the reported times to daily equivalents, it will show that time reported for all activities decrease a bit, although only school work and reading would drop dramatically.

For those watching television, and against the backdrop of rather high response rates, soapies (75%), comedy (76%), movies (85%) and music / entertainment shows (88%) were indicated often among learners' three or so favourites, with sport (65%), news and actuality (64%), documentaries (55%) and educational programmes (62%) featuring least. This profile may also not be conducive to enhanced literacy attainment, in the broader sense of the word.

Time use and other learning support at school

Learners were asked to rate the level of order and discipline at their schools. The following became apparent:
- Just more than a third of the learners considered the order and discipline in their Mathematics classes as very good, while just more than half considered it average. However, 12% rated it as very poor.
- About 45% each of learners considered the order and discipline in their English classes as either very good or average, while just fewer than 10% rated it as very poor.
- Just below 40% of the learners considered the order and discipline in their other classes as very good, while 56% considered it average. Only 5% rated it as very poor.
- For the school overall, the corresponding figures were just above one-third for very good, just more than half for average, and 14% for very poor.

It seems that the cases where more debilitating disorder may reign, would be the minority. The slightly higher trend to report confusion in Mathematics classrooms, may also reflect learners' battle to cope with subject contents.

With regard to time lost, the learner ratings revealed the following, raising some red flags as to the two-thirds to three-quarters of non-problem-free sites:
- For Mathematics, roughly one-third of the learners rated time lost each time as "lots", "some" and "none or very little" (35%, 35% and 30%).
- The corresponding picture for English language was a quarter (26%), 40% and a third (33%).
- For other subjects, it was 21%, 54% and 26%.

With regard to Mathematics classes, it also became clear that there would be some eroding of time, effort and opportunity in the following:
- The most salient reasons for high time losses (rated to occur on a weekly to almost daily basis) were given as: learner late coming (39% of cases), decisions by the school principal (25%), the weather (22%), sports

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no removal of values is reflected in the sited figures. Also, implausible top- and bottom-end values tend to cancel each other out.

events (18%), teacher late coming or absenteeism (17%), cultural events (13%), and funerals / memorials (7%).

- Class tests were written on a quarterly basis (32%), every two weeks (25%), more than once a week (21%), once a week (13%), or almost never (9%), according to the percentages of learners provided.
- The following frequencies (and percentages of respondents) applied to the feedback received from teachers after homework, test or exams, and aimed at improving the work that learners did not understand: almost never (10%), quarterly (11%), every two weeks (13%), weekly (12%), more than once weekly (14%), and daily (that Mathematics was offered) (41%).
- Textbooks were provided for personal use to learners according to 79% of them.
- Extra lessons after school was attended never (by 52%), once a semester (5%), once a term (6%), once in two weeks (9%), once a week (7%) or more than once a week (22%). (Where such classes were presented, they ranged, according to a third each of the learners, dropping off slightly across the durations given next, from fewer than 10 minutes, to between 10 and 40 minutes, to longer. In slightly more than half the cases, such extra attention was given individually. Group lessons varied from more than 25 learners in just below half the cases, to groups of 13-25 for one in six, to small groups of 12 or fewer for one in three. In more than half the cases, classes were attended once a week or more. In three-quarters of the cases, there was no payment exacted for these classes.)

With regard to English classes, similar patterns became clear on the erosion of time and effort:

- Class tests were written every two weeks (35%), on a quarterly basis (28%), more than once a week (16%), once a week (15%), or almost never (6%), according to the percentages of learners provided.
- The following frequencies (and percentages of respondents) applied to the feedback received from teachers after homework, tests or exams, and aimed at improving the work that learners did not understand: almost never (10%), quarterly (9%), every two weeks (11%), weekly (14%), more than once weekly (14%), and daily (that English is offered) (42%).
- Textbooks were provided for personal use to learners according to 57% of them.
- Extra lessons after school was attended never (by 52%), once a semester (3%), once a term (5%), once in two weeks (8%), once a week (11%) or more than once a week (22%). (Where such classes were presented, they ranged, according to a third each of the learners, and dropping off slightly across the durations given next, from fewer than 10 minutes, to between 10 and 40 minutes, to longer. In slightly more than half the cases, such extra attention was given individually. Group lessons varied from more than 25 learners in about 40% of the cases, to groups of 13-25 for one in five, to small groups of 12 or fewer again for 40% of the cases. In more than 60% of the cases, classes were attended once a week or more. In three-quarters of the cases, there was no payment exacted for these classes.)

Future plans and aspirations

The following profile was provided:

- Virtually every learner (98%) from those who responded had the intention of completing matric.
- They also felt confident of doing so (96%).
- About 93% of the responding learners also wanted to study further after school.
- Although some evidence exists that learners confused Further or Vocational Education and Training (FET/VET) colleges and other certificates with post-matric qualifications, about a quarter each of the responding learners showed interest in studying up to the following levels: FET/VET colleges after Grade 9; a 1-, 2- or 3-year diploma or certificate of some kind; a first degree at a university or university of technology; and a second or post-graduate qualification or degree.

Parental support as viewed by learners

The following strong support base became apparent:

- Parents (at least one of them) in around 70% of the overall cases were claimed by their children to assist these learners with their schoolwork by getting information for them, actually helping them do their homework, checking their homework and helping them prepare for exams.
- Helping them with test preparation and following-up after they got results, comprised the support of just more than 60% of the parents.
- Even when parents were not available, learners had access to someone else, as in the cases of about a quarter of the learners, for getting information and direct assistance with completion of homework, and about 15% to 18% for all the other support activities.

4.1.2 Parent context

Parent context as observed from the responses to the parent questionnaire, completed mostly by parents (mothers), but also other family, caregivers and even siblings, portrays the following typical , unique or otherwise interesting picture as per the following report in this sub-section. (Salient aspects were considered throughout in determining whether they would affect learner performance differentially, as reported later.)

In total, 462 parent questionnaires were completed, of which 97 were in Afrikaans, 125 in English, and 240 by isiXhosa-speaking respondents. The lower completion rate, compared to the learner questionnaires, may suggest either a literacy problem, or practical difficulties in sending out and retrieving the instruments.

We start off with the aspect that was focused on at the end of the learner context section, for easy cross-referencing.

Support to learners as viewed by parents

Parents indicated the extent and nature of their assistance as follows:

- In 47% of the cases, parents reported that they were in a position to give their children as much time as the learners required in terms of helping them with school work before and after school. In 16% of the cases, a reasonable or regular amount of time of up to an hour daily was available. In 15% of the cases, parents only had time available over weekends (about an hour a day). In 17% of the cases, parents had very little time left, quantified as fewer than 30 minutes per day. Parents did not have any time available at all in 5% of the cases.
- The nature of the help was indicated as the following: active help with homework (in 43% of the cases), checking completion of homework (39%), collecting information required by learners for school- or homework (33%), following up on test results to ensure learners do well (28%), ensuring that learners get to and from school (27%), helping learners prepare for tests and exams (24%), and paying for extra help (3%). About 25% of parents indicated the "other" option.[9]

Parents' ability to support learners can also be evaluated from the former's literacy and reading levels. The following became apparent, and although showing some promising trends, much room for improvement is also evident:

- The frequency of reading newspapers was indicated by parents as once a week or more in 40% of the cases, and as daily by 30%. The remaining parents read them once in two weeks (12%), once a month at most (12%), or never (7%).
- Magazines (or slightly more substantive material) is read daily by only 15% of the parents, at least once a week by 38%, about once every two weeks by 14%, at most once a month by 21%, and never by 11%.
- Parents never visited public libraries (or did not know where these were) in 29% of the cases. As many as 36% visited them at most once a month. About 13% indicated visits twice a month, 16% at least once a week, and 5% daily.
- Sixty percent of parents indicated that they as fathers or male caregivers could read anything they wanted to, while 22% could read most things, 16% could read a little, and only 1,5% could not read at all. For mothers or female caregivers, the corresponding percentages were 60%, 27%, 12%, and 0,7%.
- Seventy percent of the fathers/males indicated that they could write well, while 19% could write things that were considered as easy, 9% could write a little, and 2% could not write at all. For mothers or female caregivers, the corresponding percentages were 73%, 19%, 7%, and 1%.

Parents' own academic activities and plans

These were indicated as below:

- Only 15% of the fathers or male caregivers in the parent dataset indicated that they were formally involved themselves in further training or studies. For mothers or female caregivers, there were 22%.

[9] (This option was often selected in addition to any one or more of the previous options already being ticked off. Also, in the majority of cases no additional specification of such activity was provided. As a result, the unknown information is considered not as meaningful as one would initially tend to expect.)

- Of the fathers/males, another 17% indicated that they were planning to take up further training or studies, while 34% of the mothers/females would do so.

Contact with school

The following became apparent from the responses provided by parents:
- About 30% of the parents indicated that the frequency of their contact with their child's school was once per term (or about four times a year). In 17% each of the cases, contact was either more frequent at once a month, or less frequent at once a semester (twice per year). The frequency of contact then favoured a tapering off with 13% endorsing contact once a year, and 12% no contact whatsoever. Only 5% indicated contact as frequently as once a week and 7% contact on a daily basis.
- The nature of this contact was mostly given as the attendance of parent meetings (by 72% of those completing the questionnaires). This was followed by receiving newsletters (43%) and learner report cards (32%)[10]. Furthermore, parents contacted the school when necessary (30%), when requested to discuss learners' progress with the principal or teacher (28%), and when expected to sign tests or homework (24%). In only 8% of the cases did parents indicate that they helped at school events, or with maintenance or security. Just 2% served on the school governing body.

Future plans and aspirations

The prospects and plans of parents on behalf of or for their children were indicated as follows:
- Virtually everyone wanted them to complete matric.
- Only 2% of the parents doubted that their children would be able to do so.
- About 98% of those who responded (38 did not) wanted their children to study further after school.
- With most of the former responding, 30% of the parents thought that their children would study up to a first university degree. A quarter of the parents in addition thought that their children would complete a second degree or post-graduate qualification. About 21% and 19% respectively set the more modest target at either a 1-, 2- or 3-year diploma or certificate, or an FET-college qualification after Grade 9. However, at this point, 5% of parents did not think their children would study further after school.

4.1.3 School context[11]

Demographics

The following observations profile the schools well:
- In half the schools (four of them), because of being located in a large township with many isiXhosa-speaking learners, the official language of instruction was only English. For the remainder, it was both English and Afrikaans in line with provincial demographics.
- There was only one female school principal.
- As to school size, two schools had around 800 learners, three over a 1 000 but fewer than 1 200, and two more than 1 200, but fewer than 1 400.
- Three schools had more than 200 learners in Grade 8, and two between 150 and 200 learners, with the remaining one for which this item was completed, just fewer than 100.
- Most schools had two deputy-principals, and from three to seven heads of department, with three and four in terms of the latter the more common occurrence in the majority of cases.
- About equal proportions of the schools had about 20 teachers on their staff, or 25 to 30, or 31 to 35.
- Schools in the majority of cases had up to 7 or 8 Mathematics teachers, with the rest having from four to six. Of these, two typically taught at Grade 8 level. Schools in the majority of cases had 6 or 7 English teachers, with the rest having four. Of these, one, or at most two, typically taught at Grade 8 level.
- The resulting teacher:learner ratios varied from 1:25 to about 1:35, except in one case where it reached 1:41.
- Matric passrates for the previous year varied rather evenly from 60% to almost 95%.
- The poverty index ratings of the schools were from 1 to 3 (very poor to average) in 6 of the 8 cases, with two schools in the affluent category of 5.

[10] Perhaps responses were this low as it was only six months after the beginning of their child's first high-school year.
[11] As one of the schools was added late to the project group, a site visit did not take place at the time.

School conditions

The physical conditions at and facilities of the schools are best described as follows:

- In 75% of the cases, if not more, conditions were good[12] in terms of general appearance, entrance area, tapped water, electricity, and burglar bars. Half the schools, though, did not have a security fence.
- In terms of facilities and equipment, the same applied to the reception area, offices, staff room, office equipment, computer centre, and storerooms for LTSMs. However, one school did not have a staff room at all; two did not have school halls, and in two more cases these were in a poor condition; and three schools each did not have any library or sufficient venues for after-school functions (with libraries in a poor condition in an additional three schools).

Teaching time and punctuality

The indications given next portray generally acceptable levels of time management with some problem symptoms appearing in a minority of cases:

- In half or almost half the cases, it was observed/reported that teachers seldom arrived at classes late or returned late after breaks. However, in between a third and almost 45% of the cases, it happened sometimes. In at least one school, it occurred often or fairly often.
- In 75% or more of the schools, periods seldom deviated from the timetable, and learners seldom wasted time changing classes. In the remaining one or two cases, it only happened sometimes, and not often.
- The timetable was always displayed in the principal's office, and action was taken in all but one case against learners arriving late for school. Timetables were generally also quite complete in showing the start and end times of periods*, subjects by classes*, classrooms to be used, the teacher responsible for the lesson*, and the dates of examinations and tests. (* - with one exception each)
- The total time allocated to Mathematics varied from 240 to 320 minutes per week, for English from 210 to 315, and for Afrikaans, where it was a subject, from 240 to 270.
- Efforts to catch up lost teaching time were mostly evident, where it occurred, through allocating extra periods after school, or over weekends, although in dangerous environments it was not an option.
- Daily attendance and leave registers for teachers were consistently in use, as were daily learner attendance registers.
- Well-organised learner marks and promotion records were also always easily available.

Curriculum and assessment functionality

The presence and use of the relevant curriculum management and assessment mechanisms are testified to by the following observations:

- NCS copies for Mathematics and English were always available, with curriculum management plans in all but one case for Mathematics.
- The frequency with which assessment tasks should be administered was again always specified, with instruction of the type of assessment to be administered.
- The types of written assignments or extended work were also always specified.

Because of the generally high levels of compliance with minimum quality requirements in many cases, there would be insufficient variability to isolate from the questionnaire data factors that would enhance or impede learner performance, or the success of the tuition programmes, at school level.

4.1.4 Teacher/and tutor context

Because a principle-based decision was taken to recruit the tutors from within the participating project schools, and because these tutors were in only a minority of cases not the learners' own classroom teachers, the tutor and teacher information essentially overlaps. An attempt has been made (see outcomes later where the effect of contextual factors on the impact of the tutorial programme is investigated and reported on) to see if having separate tutors and teachers had any impact for some learners.

The observations that follow under their sub-headings below portray the teacher context pertaining to the study.

[12] Being asked to rate conditions as "good", "poor" or (item) "absent".

Demographics

The following distributions profile the background of the participating teachers / tutors well:

- Two-thirds of the Mathematics teachers from the project schools were male, while this figure was 40% for the control schools. For English, almost 90% of the language teachers from the project schools were female, while the portion for control schools was 50%.
- Age: Maths teachers either fell in the 25 to 34, or 35 to 44 bracket; for English the 35 to 44 and 45 to 54 brackets occurred most frequently, with one teacher each younger than that in the 25 to 34 group, and below 25.
- Home language: this was mostly isiXhosa and English, with only one Mathematics teacher in a control school being Afrikaans-speaking.
- First or additional language: by far a majority taught English as additional language (EFAL), with first language (L1) applicable in only two cases.
- Language spoken in class (conversationally): a wide range was recorded, according to the feeder area, teacher home language, and learning area, including all of only Afrikaans, only English, and only isiXhosa (4 cases for the latter), and mixes of these (especially in project schools) as either both Afrikaans and isiXhosa or both English and isiXhosa.

Qualifications and experience

- Highest qualification (in general): mostly recorded as matric plus a four-year diploma or degree, with one teacher in English in a project school having acquired a post-graduate qualification, and two Mathematics teachers having acquired only matric plus a three-year certificate/degree.
- Highest qualification for teachers in their own learning area: rather the same as above, with one Mathematics teacher in a control school having acquired only matric plus a two-year diploma/certificate.
- Date of qualification: many for English, corresponding with their age groups, predate 1998, while for Mathematics the same applied but for two as recent as 2005/6.
- By far the most teachers are actually qualified to teach FET, with only two in English in control schools being qualified for GET/Senior Phase.
- Total years of experience: 7 to 16 years for Mathematics teachers, with one teacher having only one year; 19 to 30 years for English teachers, with three in the two- to five-year bracket.
- Years of experience in the learning area: same as the total years experience in the case of Mathematics, but for English it was lower at 12 to 28 years, with more (4) now only in the 2- to 5-year bracket.
- Years at present school: lower at 1 to 7 years for Mathematics, and 12 to 22 for English, with one teacher noting one year and another six years (suggesting some mobility in both learning areas).
- Hours of learning area training, workshops, and INSET since 2000: very few (only 4 teachers) provided any information, which really came down to three to five days of half-day training for Mathematics, and about two weeks full-time training for English.

Classroom conditions (observation)

The following summary describes the situation amply:

- General appearance: for the majority rated as “poor”, except for Mathematics for project schools where most could be rated as “good”.
- Desks for every learner: it varied widely, with Mathematics classrooms in project schools rated mostly as “good” but English classrooms as “poor”, while a 50:50 split applied to control schools for both Mathematics and English.
- Teacher desks: one-third of English classrooms in project schools did not have these, while for the rest of the project schools, a 50:50 split applied, with control schools mostly rated as “good”.
- Storage space and cupboards: mostly a 50:50 split between poor and good ratings, except for English in project schools where these were also indicated as absent in half the cases.
- Sufficient lighting: mostly good, with single exceptions, especially in control schools.
- Comfortable temperature: poor in control schools, otherwise a 50:50 split between poor and good in project schools for Mathematics to good for English.
- Chalkboard: a 50:50 split between poor and good for Mathematics classrooms in project schools and English classrooms in control schools, with the rest of the cases receiving ratings of “good”.

As a result, classroom conditions could be rated on average somewhere between poor and good.

Equipment and learning support material (observation)

The following picture emerged:
- Wall charts: largely absent, except in English classrooms in control schools where "good" ratings applied.
- Calculators, and also Mathematics sets: largely absent or in poor condition (confirmed by responses in teacher questionnaires, consistently rating provision as not enough).
- Dictionaries: good supply in project schools, but poor in control schools.
- Learner-made posters: if not absent altogether, as in most cases, rated as "poor".
- Textbooks: good for Mathematics, but for English a 50:50 split between good and poor.

Therefore, on average, Mathematics equipment could be rated somewhere between poor and absent, and that for English as "poor", really.

During completion of the teacher questionnaires Mathematics teachers were rather consistent in indicating that they did not have access to the use of a personal computer, while for English teachers, the situation was closer to a 50:50 situation, if not even more in their favour.

Curriculum materials and management (observation)

The following situation was revealed:
- Copies of NCS: mostly easily available, except in project schools for Mathematics (50:50 split) and for English (rather not available freely).
- Well-organised learning programme, and pace-setting schedule: mostly available, except with a 50:50 split for Mathematics in project schools.
- Lesson plans for every period: mostly available, except with a 50:50 split in project schools for English.
- Time tables: readily available all around.
- Curriculum management plans: not so available in project schools, but indeed in control schools.
- Learner records and classlists, with mark sheets: well-organised throughout.

Therefore, on average, the situation could be rated as rather good at control schools, and the same at project schools, but for two exceptions each for Mathematics and English.

Extent of order and discipline kept by teachers (observation)

This was rated as average to good, except ratings of average for English at project schools and good for Mathematics at control schools.

Teaching responsiblities

With regard to the numbers and sizes of classes taught, the following became clear (from observation):

	Project schools Maths Gr 8	**Control schools Maths Gr 8**	**Project schools Eng Gr 8**	**Control schools Eng Gr 8**
Number of classes taught	Even spread from 1 to 5	1 to 3 only	Mostly 2 or 3, but 1 and 4 in single cases each too	Even spread from 2 to 6
Class-size range (average estimated by teacher)	Either smallish at 30-35, or often large at 50-55, with two instances at 45 (30-40, or 50-55)	Learner numbers / class sizes in the 45 to 50 range, with one exception being 55 (44-48, one 54)	Ranging rather evenly from smallish at 30-35, through 45, with many at 50 too, and one at 55 (30, 45, often 50, 55)	All in the 45 to 50 range (44-50)
Total number of learners	Once 60, but mostly 150 to 250	45-55, or 100-140	55, 90-100, 125, 150	100, 130, 200, 269

Number of grades taught: 1-3 for Mathematics, 2-4 for English (most frequently straddling Grades 8 to 10, and when Gr 11 or 12 got included, it was mostly in project schools for English.

Teaching time (but note: - records were very incomplete, and the notions below are based on but 3 to 5 in-depth cases, though):

- A majority taught in cycles of 7-day rotation.
- Working this into weekday equivalents, it became clear that the sample's Grade 8 load took the lions share of typically between 3,5 to 4,5 hours per day. For Grade 9-12, one or two periods (30 minutes) extra per day at most applied, except for some English Grade 11 and Grade 12 teachers, where it could be closer to 2 to 3 periods per day.
- This would tally to about 4 to 5 hours teaching per day in teachers' own learning areas, for a number of teachers, but there were also about half of the teachers in English who taught for only half this time at Grade 8 level.
- Inspecting the teaching load in learning areas other than teacher's main/own, English teachers also seemed to teach 1 to 3 periods per day of other subjects when their loads were low for English.
- Time taken by other activities (than teaching) per day with regard to teachers' own learning areas were also investigated, and reported typically as: an hour to 1,5 hours for preparation, half an hour to an hour each for assessment and recording/reporting activities, 40-60 minutes for extra-curricular time, and a little for guidance and counselling.
- Other learning areas also took some such time, but less, where applicable (typically 20 to 40 minutes).
- Non-teaching activities could need as much as another 1 to 3 hours per day.
- The above resulted in being occupied typically for 6-8 hours for one's own learning area, and for another 1 to 2 hours for other learning areas, where full records were provided.

In preparation for lessons, the following mostly applied:

- By far the majority of those responding reported using the NCS.
- Departmental circulars and guidelines were not used really much, especially for Mathematics and in control schools.
- Cooperation between colleagues was mainly reported for Mathematics in control schools and for English in project schools (although the data became quite erratic owing to low response frequencies).
- Where libraries were used, it was mostly for English in project schools.
- Textbooks: a majority indicated using them.
- Personal initiatives and collections of own materials were used mainly by English teachers.

Access issues

Just over a third of the teachers in each case indicated the time they took to travel to school as either more than an hour, or under 30 minutes, with the remainder belonging to the 30-60 minute bracket.

Assessment practices

The following applied during classroom observations:

- Prescribed frequencies per term: documents regulating these were mostly available, except for English in control schools (where a 50:50 split applied).
- Types of tasks indicated: in a large majority of cases these were specified throughout.
- Amount of constructed responses or extended writing indicated: mostly done in the relevant documents, but for Mathematics in project schools.
- Learner portfolios for every learner: these existed in most cases (especially for English), albeit sometimes a watered-down version of it; these were well-organised as well for Mathematics, but with a 50:50 split for English (owing to more variety and volume of contents?); these covered a variety of assessment modes in a majority of cases; they generally included test results; they reflected longer pieces of writing (mainly relevant to English); but they were only up-to-date in about 50% of the cases; there was little evidence of team tasks; and they lacked substantive teacher comments and feedback.

Reports from the teacher questionnaires indicated the following:

- Giving daily classwork and homework, especially in Mathematics, or at least 2-3 times per week, otherwise, was the most common frequency reported in this regard.

- The preferred option by far for the frequency of feedback to learners on such work was stated as after every such task given, or otherwise within the next day or at least that week.
- Tests were given mostly about every two to three weeks, with a few teachers doing that more often, and very few less often.
- Only Mathematics teachers made use often of reporting learners' progress to parents.
- A majority of teachers indicated not using additional exercises to affirm or correct gaps in concepts and knowledge, although most tried to avoid only giving right or wrong marks.
- Substantive written work, although response frequencies were low, were given with a wide ranging frequency for both Mathematics and English, ranging from daily, to once a week, through every 2 weeks, and even to once a month or fewer.
- Results of classwork, homework, tests and exams were reportedly used by a few teachers (about 4 or 5 for each learning area) to identify learners experiencing difficulty with the work, and areas of work that learners experienced difficulty with, and also to develop additional exercises to affirm concepts and knowledge.

Career aspirations and job satisfaction

The following became clear:
- Although not even half of the teachers responded to this item, those who did were all teaching in the area of their preference.
- Two Mathematics teachers and four English teachers noted that they were thinking about leaving the profession. Among the reasons cited were job security, little or no career prospects, poor management and lack of appreciation.
- The areas in which support and enrichment were most needed were cited by Mathematics teachers as better facilities and support materials at school, while English teachers mostly noted lower work- and teaching loads. In addition, regular professional development, a better salary (Mathematics teachers) and increased day-to-day monitoring and guidance (English teachers) were also selected in a number of cases.
- Four each Mathematics and English teachers intended studying further in their learning area.
- On an open-ended question about the influence of issues such as recognition, promotion, remuneration and job satisfaction on teaching quality, teachers often cited the fact that they considered their job as a calling, irrespective of such matters, but others also blamed obstacles on learners not wanting to work and on language barriers. Improving the matter of recognition would benefit teacher commitment, was noted in one case.

Time use at school

- Although most Mathematics teachers reported that none or very little teaching time was lost at their schools, English teachers more readily admitted that some or even lots of time was lost.
- The cause most often selected for lost Mathematics teaching time was learner late coming.
- For English this also applied, but teacher absence or late coming, cultural events and weather conditions were also given cited a few times.

Other tuition and support

- In half the cases of the Mathematics teachers who responded, extra-classes were reportedly offered by them at least once a week. This occurrence was far less for English teachers.
- Such Mathematics classes took mostly about 45-90 minutes a week, but it could be more. For the few cases in English, it was likely to be 45-90 minutes.
- Such classes would always be offered to a group of learners.
- Mathematics groups would be smaller at 12 or fewer, or 13-25, while English groups would be 13-25, or more than 25.

4.2 Baseline and post-test learner performance

As a broad indication of the level at which learners operate in terms of their performance levels in Mathematics and English, besides the details by school, research group and tuition attendance levels, forming the focus of the study and reported on elsewhere hereafter, it has to be said that performance levels are generally very worrying.

The main reason for saying so is that it seems as if learners barely mastered about one quarter to a third of the sample of items, reflecting the Grade 7 to 8 curriculum, broadly speaking. It can also be noted that the two instruments administered to them, were used in 2006 in a WCED-wide Grade 8 assessment. They were both specifically tailored for administration by the middle of the academic year, which was also the case in the current Shuttleworth-funded study.

As it was not the focus of the study to do in-depth diagnostic, remedial or vocational guidance analyses, but to have a consistent instrument that could serve as the external criterion for measuring learner performance across research groups and intervention conditions, only overall marks are reported.

For the 550 learners overall (the details between and across project and control groups are reported elsewhere) the pre-test or baseline score at the beginning of the second semester in 2007 for Mathematics was 28,7%. This increased marginally, again for the whole group (of 438 learners who either remained in the study or whose collaboration could be secured), to 32,3% by the time of the post-test late in the fourth quarter.

The comparative situation for the English paper is a baseline score of 33,4% (n=569) remaining in that order at the post-test administration with a score of 34,8 (n=410).

Given this general picture, further analyses would focus on the direct effects of tuition attendance on learner performance, and afterwards also on how that got mediated by any contextual factors that may have impeded or enhanced such performance.

4.3 Tuition contents, and learner attendance

As mentioned before, information was collected on a session-by-session basis on two aspects of the delivery of the tuition programmes. The first covered the tutorial contents and dynamics themselves, and the second learner attendance.

In addition to information that was collected and required for research purposes in this way, this activity was also designed to serve at least two additional objectives. The first of these was to provide tutors/teachers with an instrument, and an example of how to implement it and derive value from it, for self-monitoring, in essence. Recording in exact ways the contents covered per session, attendance records, and any of the other related information as reflected on in Section 4.3.1 below, would serve them as an important record for planning, assessment, evaluation, feedback and other purposes.

The second objective was to provide the research team with an additional quality-control mechanism. The fact that tutors had to keep a very detailed record of both learner attendance and tuition contents required accepting a great measure of responsibility for learner presence, participation and even commitment, and also their personal preparation and delivery of the tutorial materials.

4.3.1 Delivery of tuition contents

It became evident at this stage that it would be difficult to analyse variations between tutors, schools and sessions in any detail. This would be because of three potential reasons. In many instances there was just not sufficient variability in the response patterns. The result of this is that descriptions of certain aspects of the fact of delivery were identical across the whole project group, and does not allow for high or low measures of a construct to be related to any other variable, such as learner performance improvement over time.

A second possible result would at times be the low cell frequencies that would arise if one attempted to break down overall information into smaller sub-categories. An example would be trying to compose separate sub-sets of data in terms of groups of learners with high or low attendance levels and performance score improvements pertaining to sessions that did or did not make use of a whole-class teaching approach.

The third difficulty would be related to the finding that a very high requirement had to be set for what constituted an “acceptable” attendance level (see Section 4.3.2 below). Learners who missed more than three sessions appeared to start battling with mastering the learning contents. An artifact of looking at a reduced number of sessions in which a learner experienced a certain dynamic, would also reduce the number of

sessions to below the point that would ensure deriving optimum benefit from the tutorial programme as a whole. As an example, it means that one would have very little leeway for analysing the benefits to learners of attending the three or four sessions, for instance, in which the learning outcome pertaining to Algebra contents got covered.

Analyses of the completed spreadsheets for Mathematics tuition revealed a number of interesting aspects, and at an overall level, the following became apparent:

- Textbooks were not freely used during tuition, but were reported at least once each in the cases of the two large township schools in the Mitchell's Plain area.
- Whole-class teaching and concentrating on the completion of exercises were the predominant teaching approach or methodology.
- The thematic contents of the topics covered were unique to each session as per the tuition worksheets.
- By far the most of the work per session appears to have been pitched at Grade 8 level, leaving little opportunity to remedy lacking earlier conceptual or knowledge bases.
- Specific problem areas identified, albeit recorded rather sporadically, included operations related to calculations as such, handling brackets, doing subtraction and executing substitution.
- The learning outcomes covered was also largely determined by the composition of the tutorial materials. Tutors' own actions to create opportunities to address certain outcomes, and their understanding of what each session in fact covered anyway, resulted in them recording a reasonably balanced spread of outcomes. These included the five outcomes related to numbers, algebra, shapes and space, measurement, and data.
- Virtually no use was made of learning support material. In isolated cases reference was made to wall charts and newspapers.
- Assessment activity mostly and by far concerned evaluation of the classroom dynamic.
- Learner motivation levels were generally rated as most of them being positive, with some variance towards everyone being very enthusiastic, on the one hand, to average, on the other hand. In one of the four project schools, the "average" or middle option was endorsed most often.

Analyses of the spreadsheets returned for English tuition revealed the following:

- Textbooks were consistently indicated as not used (or available).
- Although whole-class teaching was concentrated on most, there were also indications of sessions where the completion of exercises (individually and in teams), or some variation between working in groups (teams) or pairs occurred.
- The thematic contents of the topics covered were unique to each session and determined by the tuition worksheets.
- The work per session appears to have been pitched often also at Grade 7 level in addition to the Grade 8 implementation focus of the programme, which in principle would create some opportunity to do revision of earlier concepts or knowledge.
- Specific problem areas identified varied a little according to school, but frequently included spelling, vocabulary, and understanding instructions well.
- The learning outcomes covered was again largely determined by the composition of the tutorial materials. Tutors' own initiatives to link the themes or topics of sessions to certain outcomes, and their interpretation of what each session in fact covered anyway, resulted in them most frequently recording reading and thinking (reasoning) skills as the two key learning outcomes covered. This was followed, if not equalled, by grammar and vocabulary. Speaking and writing skills seem to have been emphasised slightly less, in positions four and five. The sixth, and least covered, outcome was listening skills.
- Dictionaries were frequently recorded as the item of learning support material used, followed by magazines.
- Assessment activity mostly and by far concerned evaluation of the classroom dynamic as such.
- Learner motivation levels were generally rated as a balance between most of them being positive, and merely average (the middle option). However, in two schools there was also some measure of ratings considering most learners to have been passive or lethargic during a number of the sessions.

Without being able to test this hypothesis or preliminary observation empirically or quantitatively, it was evident that where the learner motivation levels were lowest towards the Mathematics tuition sessions, the project school got outperformed by its control school by a large measure in terms of learner performance improvement over time. In the case of English tuition, this pattern was consistent in the case of a different project- and control-school pair, but did not apply in the second pair, which happened to be the same one as

referred to just before in the case of Mathematics. However, in both these pairs where learners had been rather unmotivated towards the English tuition programme, high attendance levels did not lead to significant benefits above low attendance levels. In fact, the contrary prevailed.

This observation may contribute much more to the findings of the study than appears evident at face value. It may signal that tutors or teachers (or schools) who do not succeed in getting learners enthusiastic about spending additional time on mastering their learning contents, may just as well not spend any further effort on delivering such programmes. Should one not be in a position to lay all or most of the responsibility on the teaching or school staff for achieving this motivation, as suggested above, because learner commitment may be inherently eroded for other bigger reasons, which may for argument's sake be linked to matters such as crime levels or gangsterism, or parental values and their inability to support their children, etc., this should also be noted. Under such conditions, other learner-based interventions would be required before engagement in additional tuition could be considered.

4.3.2 Learner attendance

The learner attendance records show that learners attended the designated 20[13] sessions quite well. Worked into a percentage calculation (i.e., the percentage of the available maximum total sessions that a learner attended), records show that the average attendance at Mathematics sessions was 73,5%, and at English sessions 75,2%. This means that the average learner missed about five sessions, although attendance levels were actually much better, because a minority of learners was responsible for the decreased average through quite poor attendance.

The four project schools every time clustered reasonably close to the two averages. For Mathematics, there was one exception, with learners achieving high average attendance of 85,6%. For English, the learners from one school had a relatively low attendance score at 67,9%, and those from another (the same school as for Mathematics) a high score at 84,6%.

The distribution of attendance figures above also supported the decision at a later stage of the analysis to consider good and less good attendance levels as pivoting around a realistic cut-off point somewhere above the average situation, which would be closer to missing not more than three sessions at most. (Also see the additional short discussion at the beginning of Section 4.4 hereafter.)

4.4 Difference-in-difference analysis (the effect of the tuition programme)

The main objective of the evaluation, to detect if the tuition programme would benefit the learners undergoing it, translates into two strategies for determining just that. The first would be to establish if learners from the project schools were indeed better off over time than learners from control schools. The second would be to detect if learners within the project group would benefit more over time if they got exposed to more tuition, compared to lesser benefit from lesser exposure. The best way to quantify the latter at learner level was to split them into two sub-groups according to high and low levels of attendance at tuition sessions.

After initially thinking, on visual inspection of frequency distributions and mean scores, that attending at least 62% of the tuition sessions would lead to the best variance in performance improvement between those learners who had low and high attendance levels, closer simulations and inspections on the data actually suggested differently.[14] This would also address the fact that many of the low-attendance cell frequencies at school level became quite small with the split at the 62% attendance cut-off point. As a result, a new cut-off point was put where attending more than 82% of the tutorial sessions was considered as high. This assumes, and shows hereafter, that learners who missed more than three of 20 sessions, may have started losing the benefit of the tuition programme, especially in the case of Mathematics.

Tables 4.1 to 4.5 summarise the outcomes of the resulting difference-in-difference analyses.

[13] In the case of one school, this became 19 sessions, and for another 23 or 24, depending on the learning area, when sessions had to be split because of slow progress. These sessions always covered the envisaged work to be presented.
[14] The team undertook to explore this option further only during and after discussions (with the research participants) of the preliminary findings at the 11 February 2008 workshop.

Table 4.1: Pair 1 (Schools 101 & 206)

Pair	* Schools (code) (n=total learners)	Mathematics Pre-test (n) %	Mathematics Difference (in %-pts) →	Mathematics Post-test (n) %	English Pre-test (n) %	English Difference (in %-pts) →	English Post-test (n) %	Tuition attendance **
1 (n=170)	Project (101) (n=92)	(12) 29,6	0,2	(12) 29,8	(20) 31,0	+5,7	(20) 36,7	Low
		(29) 30,3	+1,6	(29) 31,9	(22) 27,5	+8,7	(22) 36,2	High
		(41) 30,1	+1,1	(41) 31,2	(42) 29,1	+7,3	(42) 36,4	Both tests
		(71) 28,9	+2,3	(41) 31,2	(68) 29,4	+7,0	(42) 36,4	All
	Control (206) (n=78)	(29) 23,9	+4,2	(29) 28,1	(31) 29,6	+4,6	(31) 34,2	Both tests
		(55) 24,8	+2,7	(32) 27,5	(58) 29,4	+4,3	(34) 33,7	All

* Whereas all frequencies (n) in these two columns indicate the total number of learners having completed at least one performance instrument or contextual questionnaire (and beyond that any mix of these), the remaining frequencies in the table refer to the numbers of learners having completed only the relevant performance assessment instruments listed.
** Low attendance was taken as attendance of 82% or fewer of the sessions, while high attendance entailed attending more than 82%.

The resulting difference scores, therefore, are as follows:

- For Mathematics:
  - ☺ The high-attendance group outperformed the low-attendance group by 1,4 %-points.
  - ☹ For paired testing, the project group was outperformed by the control group by 3,1 %-points.

- For English:
  - ☺ The high-attendance group outperformed the low-attendance group by 3,0 %-points.
  - ☺ For paired testing, the project group outperformed the control group by 2,7%-points.

Note: - When looking at the combined figures (unpaired testing) for "all" available learners, the gap in favour of the control group for Mathematics is largely reduced.

Table 4.2: Pair 2 (Schools 102 & 205)

Pair	* Schools (code) (n=total learners)	Mathematics Pre-test (n) %	Mathematics Difference (in %-pts) →	Mathematics Post-test (n) %	English Pre-test (n) %	English Difference (in %-pts) →	English Post-test (n) %	Tuition attendance **
2 (n=238)	Project (102) (n=79)	(12) 32,9	+1,8	(12) 34,7	(33) 34,3	+3,4	(33) 37,7	Low
		(18) 27,2	+7,7	(18) 34,9	(29) 36,4	-1,2	(29) 35,2	High
		(30) 29,5	+5,3	(30) 34,8	(62) 35,3	+1,2	(62) 36,5	Both tests
		(34) 30,1	+6,6	(34) 36,7	(67) 35,0	+1,3	(64) 36,3	All
	Control (205) (n=159)	(76) 31,0	+2,0	(76) 33,0	(66) 42,5	+1,8	(66) 44,3	Both tests
		(79) 30,6	+2,4	(77) 33,0	(76) 42,4	+1,3	(67) 43,7	All

* Whereas all frequencies (n) in these two columns indicate the total number of learners having completed at least one performance instrument or contextual questionnaire (and beyond that any mix of these), the remaining frequencies in the table refer to the numbers of learners having completed only the relevant performance assessment instruments listed.
** Low attendance was taken as attendance of 82% or fewer of the sessions, while high attendance entailed attending more than 82%.

The resulting difference scores, therefore, are as follows:

- For Mathematics:
  - ☺ The high-attendance group outperformed the low-attendance group by 5,9 %-points.
  - ☺ For paired testing, the project group outperformed the control group by 3,3 %-points.

- For English:
  - ☹ The high-attendance group is outperformed by the low-attendance group by 4,6 %-points.
  - ☹ For paired testing, the project group is outperformed by the control group by 0,6%-points.

(Note: - When looking at the combined figures (unpaired testing) for "all" available learners, the gap in favour of the project group for Mathematics will be even bigger.

- When looking at the combined figures (unpaired testing) for "all" available learners, the gap in favour of the control group for English will disappear.

Table 4.3: Pair 3 (Schools 103 & 207)

Pair	* Schools (code) (n=total learners)	Mathematics Pre-test (n) %	Mathematics Difference (in %-pts) →	Mathematics Post-test (n) %	English Pre-test (n) %	English Difference (in %-pts) →	English Post-test (n) %	Tuition attendance **
3 (n=178)	Project (103) (n=91)	(35) 26,5	+1,7	(35) 28,2	(24) 29,8	-1,8	(24) 28,0	Low
		(26) 25,5	+3,6	(26) 29,1	(20) 33,2	-3,4	(20) 29,8	High
		(61) 26,1	+2,5	(61) 28,6	(44) 31,3	-2,5	(44) 28,8	Both tests
		(72) 26,7	+1,3	(67) 28,0	(63) 30,2	-1,5	(60) 28,7	All
	Control (207) (n=87)	(57) 31,3	+11,1	(57) 42,4	(25) 39,0	-5,9	(25) 33,1	Both tests
		(79) 30,7	+11,6	(58) 42,3	(77) 39,1	-6,0	(25) 33,1	All

* Whereas all frequencies (n) in these two columns indicate the total number of learners having completed at least one performance instrument or contextual questionnaire (and beyond that any mix of these), the remaining frequencies in the table refer to the numbers of learners having completed only the relevant performance assessment instruments listed.
** Low attendance was taken as attendance of 82% or fewer of the sessions, while high attendance entailed attending more than 82%.

The resulting difference scores, therefore, are as follows:

- For Mathematics:
  - ☺ The high-attendance group outperformed the low-attendance group by 1,9 %-points.
  - ☹ For paired testing, the project group was outperformed by the control group by 8,6 %-points[15].

- For English:
  - ☹ The high-attendance group was outperformed by the low-attendance group by 1,6 %-points.
  - ☺ For paired testing, the project group outperformed the control group by 3,4%-points.

(Note: - The high surge in the marks of the learners from the control group for Mathematics appears strange, and unnatural inflation of their post-test scores may have jeopardised the comparison.
- When including the combined figures (unpaired testing) for "all" available learners, the gap in favour of the project group for English will be even bigger.

Table 4.4: Pair 4 (Schools 104 & 210)

Pair	* Schools (code) (n=total learners)	Mathematics Pre-test (n) %	Mathematics Difference (in %-pts) →	Mathematics Post-test (n) %	English Pre-test (n) %	English Difference (in %-pts) →	English Post-test (n) %	Tuition attendance **
4 (n=188)	Project (104) (n=96)	(3) 42,9	-15,1	(3) 27,8	(12) 35,1	-6,3	(12) 28,8	Low
		(13) 26,6	+3,3	(13) 29,9	(33) 26,4	+5,7	(33) 32,1	High
		(16) 29,6	-0,1	(16) 29,5	(45) 28,7	+2,5	(45) 31,2	Both tests
		(70) 26,2	+1,8	(45) 28,0	(70) 29,2	+2,2	(47) 31,4	All
	Control (210) (n=92)	(85) 30,6	+0,6	(85) 31,2	(70) 31,1	+1,4	(70) 32,5	Both tests
		(90) 30,6	+0,6	(85) 31,2	(90) 30,8	+1,8	(71) 32,6	All

* Whereas all frequencies (n) in these two columns indicate the total number of learners having completed at least one performance instrument or contextual questionnaire (and beyond that any mix of these), the remaining frequencies in the table refer to the numbers of learners having completed only the relevant performance assessment instruments listed.
** Low attendance was taken as attendance of 82% or fewer of the sessions, while high attendance entailed attending more than 82%.

[15] At the 11 February 2008 workshop participants requested that potential school and teacher "best practice" conditions be investigated as explanation for the excellent control-school improvement over time. Conditions, equipment, facilities, and time and curriculum management appeared quite average, if not below it. The only two unique aspects noted was that the Mathematics teachers for Grade 8 were both female, and had one of the most favourable teacher:learner ratios and workload situations. The school also had the highest number of Mathematics teachers compared to any of the other schools in the study. In a way, the impact of these favourable conditions was reflected in two reported classroom-practice matters. In this control school, compared to the rest of the schools, the highest proportion of learners considered the discipline in the Mathematics classes to be very good, and very little time to be lost in classes. The only additional observation was that learners from this control school reported the highest levels of newspaper reading frequency.

The resulting difference scores, therefore, are as follows:

- For Mathematics:
  - ☺ The high-attendance group outperformed the low-attendance group by 18,4 %-points.
  - ☹ For paired testing, the project group was outperformed by the control group by 0,7 %-points.

- For English:
  - ☺ The high-attendance group outperformed the low-attendance group by 12,0 %-points.
  - ☺ For paired testing, the project group outperformed the control group by 1,1%-points.

(Note: - When looking at the combined figures (unpaired testing) for "all" available learners, the gap in favour of the control group for Mathematics will convert to become in favour of the project group.

Table 4.5: Combined (all project schools & control schools together)

Pairs	* Schools (code) (n=total learners)	Mathematics Pre-test (n) %	Mathematics Difference (in %-pts) →	Mathematics Post-test (n) %	English Pre-test (n) %	English Difference (in %-pts) →	English Post-test (n) %	Tuition attendance **
All (n=774)	Project (101 to 104) (n=358)	(62) 29,1	+0,7	(62) 29,8	(89) 32,4	+1,2	(89) 33,6	Low
		(86) 27,7	+3,7	(86) 31,4	(104) 30,7	+2,7	(104) 33,4	High
		(148) 28,3	+2,4	(148) 30,7	(193) 31,5	+2,0	(193) 33,5	Both tests
		(247) 27,7	+2,6	(187) 30,3	(268) 30,9	+2,2	(213) 33,1	All
	Control (205-7, 210) (n=416)	(247) 30,1	+3,9	(247) 34,0	(192) 35,9	+1,0	(192) 36,9	Both tests
		(303) 29,6	+4,2	(251) 33,8	(301) 35,6	+0,9	(197) 36,5	All

* Whereas all frequencies (n) in these two columns indicate the total number of learners having completed at least one performance instrument or contextual questionnaire (and beyond that any mix of these), the remaining frequencies in the table refer to the numbers of learners having completed only the relevant performance assessment instruments listed.
** Low attendance was taken as attendance of 82% or fewer of the sessions, while high attendance entailed attending more than 82%.

The resulting difference scores, therefore, are as follows:

- For Mathematics:
  - ☺ The high-attendance group outperformed the low-attendance group by 3,0 %-points.
  - ☹ For paired testing, the project group was outperformed by the control group by 1,5 %-points.

- For English:
  - ☺ The high-attendance group outperformed the low-attendance group by 1,5 %-points.
  - ☺ For paired testing, the project group outperformed the control group by 1,0%-points.

For Mathematics, there was absolute consistency across the school pairs, and overall, in terms of the learner performance improvement over time being larger for those learners who had attended more than 82% of their tutorial sessions compared to those learners who had not. This clearly points to a promising possibility of remedying performance levels as late as in Grade 8, in as little as six months, when there is some minimum level of commitment among learners and tutors. However, some inconsistencies apply to the ability of project schools to outperform control schools, and these are investigated and discussed further later.

The picture for English is in some senses more erratic when looking at the between-pairs comparisons. However, at the overall level project schools outperformed control schools in terms of improvement over time, and those learners who had attended more of their tutorial sessions derived greater benefit compared to those learners who had not.

There are also inconsistencies between schools in terms of the size of the effects that are observed, and in terms of which learning areas feature in which ways in each case/pair. What can be concluded at the level of the project- and control-school pairs is that only in three of the eight potential sets of learning area by school-pair comparisons the increases from pre- to post-test scores exceeded five %-points and could be seen to be approaching the 10 %-point growth target within a year as hoped for.

Also, the tuition interventions can be said to have favoured the high-attendance learners consistently only in the case of Mathematics. Other factors, such as teacher or learner-related contextual factors, have as a result to be examined to see if effects would be more consistent under certain conditions (see further down).

One should, therefore, at least for the time being, guard against becoming too excited about whichever desirable or expected findings one observed, as shifts often seem to have been little and erratic across schools, learning areas, and tuition attendance.

One potential reason for such inconsistencies may be low cell frequencies in the case of attendance level analyses within school pairs. The other, which was explored next, would be the circumstances under which improvements occurred, which may be much more related to external conditions, home context, teacher and tutor factors, school factors, and the like, than one would have imagined at the outset. The tuition programme was, as a result and relative to other factors, not the clearly stronger or only route to follow to remedy the current learner performance under-achievement concerns.

Broader learner performance correlations

As expected, pre- and post-test scores for candidates for English and Mathematics correlated significantly. This means that high-scoring candidates remained that from baseline to post-test, or the inverse (low to low). Another consequence is that the difference scores between pre- and post-testing also had a high positive correlation with the post-test, but a high negative correlation with the pre-test. This means that candidates starting low on the baseline experienced higher possibility to improve, while those who started off high, could not improve so strongly any more.

A number of significant and informative observations are noted next. The first is that scores correlated significantly between all pre- and post-tests across learning areas. This means that learners who scored high on either test at the baseline, also scored high in both other tests at the post-test. This is to be expected, as better performing learners tend to consistently over time and learning area perform well, and the inverse.

The second observation is that the same learners tended to have either high, or low attendance rates at the tuturial sessions. This is also expected, and is a reflection of someone's conscientiousness and commitment.

The third observation shows that the better learners' attendance at the English tutorial sessions had been, the higher their Mathematics post-test scores were. Although to some degree expected in terms of the explanations already provided, it does in addition point to some exciting transference of dynamics across learning areas.

The fourth observation is about Mathematics tuition attendance being related positively to the Mathematics post-test scores. This means that the more diligently sessions had been attended, the higher the post-test scores were. One should be careful not to assign causality direction too quickly, but it does signify some link between commitment to a learning area and improving one's abilities.

The fifth observation relates to the fact that it seems as if the high-attendance learners at Mathematics tutorials achieved below average English difference scores (numbers again are relatively low). That could signify the fact that effort in one tutorial programme detracts from the energy that learners have available to attend and make a success of another learning area at the same time. (However, low attendance in English tutorials was associated with low Mathematics difference scores, on the other hand, signalling something else, such as non-commitment.)

Table 4.6 reflects the correlation coefficients of the various interactions just discussed.

Table 4.6: Correlation coefficients between attendance, performance and performance improvement scores

(Decimals omitted in correlation values)	## Maths pre-test	Maths post-test	Maths diff pre-& post-	Maths tuition attendance	English pre-test	English post-test	English diff pre-& post-	English tuition attendance
# Maths pre-test	1							
Maths post-test	** 460	1						
Maths diff	** -415	** 617	1					
Maths tut att	019	* 173	054	1				
English pre-test	** 233	** 256	062	050	1			
English post-test	** 218	** 255	071	-007	** 509	1		
English diff	-048	011	043	-034	** -468	** 523	1	
English tut att	045	** 235	119	** 740	-011	-039	019	1

* Significant at the 0,05 level
** Significant at the 0,01 level

Note: Row headings (# to the left) reflect shortened versions of column headings (## at the top)

4.5 The influence of selected contextual variables on the findings

The primary question in this section is that if the fact that learners had attended extra tuition (and that some learners had been more diligent in attending these) could not strongly and/or consistently explain higher improvements in learner performance scores above the baseline, what can then?

A first intuitive response or explanation, which seems warranted by the low baseline learner scores in both Mathematics and English, is that learner foundational knowledge gaps are much worse than anticipated. We may have to accept that most learners were just not able to benefit from the tuition optimally because the bedrock on which to build was still too brittle. (This matter is debated further in the conclusion sections.)

In addition to such assumed low learner foundational knowledge levels, there could be a host of other contributing factors. Aspects such as teacher learning area pedagogy and content knowledge come to mind. This may strongly support the consideration that learner improvement may take longer and require more effort than hoped for.

The next hypothesis to state, therefore, and to test further from the data, is that some conditions and factors outside the tutorial delivery as such, and its good or poor attendance, played a very strong part in enabling or limiting variations between the pre-and post-test scores of either those learners within the project group, or between those in the project and control groups. Such potential factors could exist within the context and dynamics pertaining to parents, learners, teachers or schools, not to neglect the tutorial materials or their presentation.

As the design was not intended to carry analyses of this potentiality to its full extent, also in terms of the relatively small size of the sample, simultaneous modelling through complex approaches such as path analysis and multiple regression could not be conducted. However, iterative (that is, isolated or independent) comparisons of mean scores[16], crosstabulations of frequencies and correlations could still be used, although these pose higher risks of over-explaining trends after some point (by exceeding the so-called degrees of freedom requirements applicable to statistical generalisation, principles related to collinearity effects and the risk of obtaining contaminated coefficients, etc.).

[16] Analysis of variance (ANOVA). Within-group differences are normally larger than between group differences, because of the many layers of grouping and cells (e.g., attendance level and any given variable analysed) related to performance improvement. The f-statistic and significance / probability level also apply at an overall level only, and do not allow one to make conclusions about which subgroups differ significantly, and which not, without further more sophisticated explorations.

The focus of the resulting further explorations has been twofold. Any direct links between such contextual variables and the performance difference or improvement scores were studied. The other more important effort was to establish if any such links were mediated by the level of tuition attendance on the side of learners. This was all done mainly by comparing the mean scores of respondents allocated to different sub-groups in the process. Here and there further Pearson and Spearman correlation coefficients and chi-square statistics from contingency tables were also looked at when indicated.[17]

In the section below, not every analysis that had been conducted was reported, but only those that seemed to offer promising explanations of the conditions under which extra tuition would enhance learner performance.[18] This includes discoveries about contextual factors and demographic variables that seem to suggest different levels of uptake of the effects of the tutorial programmes. As with the difference-in-difference analyses above, the initial findings based on the 62%-level tuition attendance cut-off was re-run for the 82% cut-off adopted during a second stage.

4.5.1 Learner variables

Sex/gender

Within the project group[19], and partly as expected for reasons of their generally higher levels of commitment and self-discipline at the Grade 8 age, girl students on the whole experienced higher increases than boys from pre- to post-test scores for both Mathematics and English. Low-attendance boys also did worse in the post-tests than the pre-tests, while girls always improved. However, at high-attendance levels for Mathematics, boys' improvement was stronger, almost double that of girl students', although for English still below that of girls. In the full dataset[20] this gender difference surprisingly disappeared, even when analysing control- and project-school learners separately, with the only exception girl students' larger improvements compared to boys' for English in project schools. This finding may suggest that girl students respond better than boys to at least extra language tuition.

The figures directly comparing the performance trends of boys and girls for the smaller dataset comprising only paired test data by tuition attendance level are presented in Table 4.7. This is done to give an illustration of how the interactions between attendance level and any given variable on the difference (or improvement) scores for learner performance over time in the two learning areas of the study were handled. This also makes it easier to follow the rest of the discussion below where many more variables got analysed. It also shows that the 82%-split for attendance resulted in a much better frequency distribution within the various subgroups, reducing the outcome of low cell frequencies. Key observations are underlined or recorded in boldface to highlight how the interaction effects got identified.

Table 4.7: Interaction between sex and tuition attendance level in influencing tuition benefit

Tuition attendance level*	Sex	Maths improvement score (n)	English improvement score (n)
82% and below (Low)	**Male**	-1,1 (29)	-0,1 (36)
	Female	<u>2,2 (33)</u>	<u>2,1 (53)</u>
	Total	0,7 (62)	1,2 (89)
Above 82% (High)	**Male**	<u>5,2 (25)</u>	2,2 (25)
	Female	3,1 (61)	<u>2,8 (79)</u>
	Total	**3,7 (86)**	**2,7 (104)**
All respondents	**Male**	1,9 (54)	0,9 (61)
	Female	<u>2,8 (94)</u>	<u>2,5 (132)</u>
	Total	2,4 (148)	2,0 (193)

* Relevant to the learning area reported in the columns to the right

[17] Making use of SPSS statistical software.
[18] With no p-values < 0,01, and some between 0,01 and 0,05, a few findings with p-values > 0,05 were also included.
[19] For those participants with pre- and post-test scores as well as tuition attendance records.
[20] This time including everyone who did either a pre-test, or a post-test, or both. This split is followed throughout below.

Test language (Mathematics only)

For learners who participated in the tuturial sessions, those completing their pre-and post-tests in Afrikaans showed larger performance increases over time than those who completed the Mathematics test in English, especially in the low-attendance group. In the full dataset, there appeared to be contradictory test-language effects between the control- and project-school learners. (This result is better studied by looking at home language hereafter, as the more fundamental variable, and also because the language tutorials and testing covered only English.)

Home language

In Mathematics, learners with Afrikaans as home language consistently showed the highest improvement scores, while those with English home language achieved the lowest. In the cases of English and isiXhosa as home languages under low-attendance conditions, gains were negative and very low, respectively. In the learning area of English, learners with isiXhosa as home language showed lower improvement scores compared to Afrikaans- and English-speaking ones, except when they attended their tuition sessions well, in which case they overtook Afrikaans-speaking learners slightly. This suggests that even as late as Grade 8, isiXhosa learners can benefit from (good attendance at) a tutorial programme, even when it seems likely that their mastery of the languages of learning and teaching may still be comprised, generally speaking. Attendance levels in the cases of English- and Afrikaans-speaking learners did not seem to make a further difference for the good, though. In cases where certain minimum levels of commitment, effort or competence may be assumed, such as with low-attendance Afrikaans-speaking learners at English tutorial sessions, and high-attendance of Mathematics tutorials, improvements were also larger. (This could also still point to cell frequencies becoming too low to expect complete consistency of trends.) From the full dataset, the picture with regard to language is absolutely confirmed. However, for Mathematics for learners from the control schools, isiXhosa-speaking learners showed the greatest improvement. Possible explanations could be starting off from a very low baseline score (regression to the mean), or attempts by teachers and learners to show what could be done when going it alone.

Teacher identity

Only in isolated cases, for Mathematics, was classroom teacher identity related to either higher or lower increases of scores over time. This was consistent across level of tuition attendance, although cell frequencies fell too low to always be sure. Where cell frequencies were high enough, a similar and even clearer picture emerged for English. However, and this suggests that sub-samples are too small to detect patterns consistently, there were also isolated cases where the identity of learners' Mathematics teacher was related to their language performance improvement, or deterioration. The same was true, again in a stronger measure, as could be expected, for the effect of language-teacher identity on Mathematics performance improvement.

Having English as home language (L1) or as additional language (EFAL/L2)

This variable could also serve as proxy for looking at the effect of having the same or a different home language than the official language of instruction that one gets taught in. There was no consistent effect for Mathematics above attendance at the tutorial sessions. (This means that as long as learners attended the tutorial sessions well, it did not matter what their home languages or languages of instruction were.) With regard to English improvement, mother-tongue speakers of English even benefited under conditions of low tuition attendance. However, second-language speakers of English had to attend well to benefit. On the whole, mother-tongue English speakers also benefited slightly more than second-language speakers of English in terms of improvement over time.

The interaction between language of instruction and home language (i.e., whether each learner received the tuition in the same language as his or her home language or not) and its effect on learner performance improvements in both learning areas was then investigated somewhat more. Afrikaans-speaking and isiXhosa-speaking learners predominantly had different tuition and home languages for English tuition, while English-speaking learners had the same. For Mathematics, it only differed for Isi-Xhosa learners. In the latter case, this fact did not jeopardise their ability to improve their scores from pre- to post-test at all. On the contrary, isiXhosa-speaking learners improved more than anyone else, presumably, as already noted, because they started from lower baselines, but this did not prevent them from achieving on par with other groups by the

time of the post-test. For English, however, Afrikaans-speaking learners still managed to improve about as much as English-speaking learners over time, although the former's performance levels on the whole was about six %-points lower at both the pre- and the post-test points compared to the latter's, as expected. IsiXhosa-speaking learners, although performing on par at the outset with Afrikaans-speaking learners, could not improve their scores. It does therefore appear that there may be a ceiling effect with regard to English improvement for isiXhosa-speaking learners by Grade 8.

Age

Turning 14 in Grade 8, or having been born in 1993 for the 2007 study, was by far the optimal age for improvement. Both under-aged (or younger) and over-aged (or older) learners could not match the performance improvements of the 14-year olds. This was valid across learning areas, tuition-attendance levels, and participation in the tutorial programme as such, looking at the paired test-data. Interestingly enough, the one-year younger group of 13-year olds, with a birth date of 1994, improved second most, followed by the 15-year olds (born in 1992). Outside these three groups, performance improvements quickly faded away, although cell frequencies were also becoming small. Inspection of the full dataset, where school-identity could be used as proxy for population group, seems to suggest that for black learners, generally speaking, it may be "beneficial"[21] to be a year, or sometimes two, older than the above averages, as that is when optimal improvements took place, more visibly so for Mathematics. This suggests that it may take them longer to become proficient in their work for a number of potential reasons associated with backlogs, equity and the like.

Access to school

Too little variation occurred in factors, such as distance to school, mode of travel, time to travel, and the resulting risk of being late, to analyse them for separate effects. It did appear, though, that those learners who very seldom or never were late for school, improved more than others in English over time, an effect enhanced by high tutorial attendance levels.

Previous performance

Although previous performance in the same or different learning areas and current performance in different learning areas always correlated significantly to (other) current performance scores in the study, as expected from learners consistently doing well or poorly, only one additional effect became clear. This effect, at the overall level (as the cell frequencies were too low too detect otherwise), is a correlation between the reported Grade 7 end-of-year performance marks for Mathematics, English and especially Life Orientation with the difference or improvement score for only Mathematics. A possible explanation could be that previous achievement fosters later commitment, and that the values and knowledge imbued in Life Orientation as learning area may contribute to this.

Facilities at home

Not enough variation existed for many commodities to analyse, such as water and electricity. Satellite TV possession, though, seemed to be a ball and chain around the ankle to those Mathematics learners who had access to it, as their performance did not nearly improve as much as that of learners who didn't have access. As a matter of fact, their performance often deteriorated. This effect (the different extent of the improvement) was consistently stronger for low-attendance learners, signalling its power if not countered by attending a tutorial programme well. Inversely, those who had access to PCs improved much more than those who did not (assuming benefiting from access to resources such as the Internet, or more productive ways of working, helpful software, etc.). Good improvements in English scores over time were also associated with computer access, but in addition also with satellite TV, and in the latter case especially at low levels of tutorial attendance. Some low frequencies may make this conclusion unstable, though. However, this may also signify that language improvement may benefit from viewing TV and Internet, even should learners have lower levels of commitment, structure or focus towards a tutorial programme.

[21] Without in any way suggesting that the situation should be condoned, but mentioned to explain that at the Grade 8 level, schools can do little about this any longer, as solutions lie elsewhere and earlier in the system.

Bedroom and sleeping arrangements did not show any consistent association with performance improvements.

Reading opportunity

When tutorial attendance was high, for both learning areas, the more books of their own learners had at home (1-10, through 11-20, to 21-50), the more their performance improved over time. (In the low-attendance group, and when learners had none or more than 50 books of their own, the pattern did not hold well, most likely because the cell frequencies were too low.)

The pattern was virtually the same, if not stronger and more consistent, when looking at the increasing presence of other books in the home. No differences were apparent between learners from the broader control and project groups/schools, signalling that a broad reading baseline, or the lack of it, has a very strong effect on learners' academic performance, whatever else they do.

Reading newspapers more frequently was only associated with higher performance improvement scores in Mathematics for high-attendance learners. Reading magazines more frequently, on the other hand, was only associated with higher performance improvement scores in English (mostly for high- but also partly for low-attendance learners). These two findings may suggest that there is some interaction between having undergone tuition and being referred to or otherwise stimulated to read appropriate additional content materials. Reading contents may have covered more day-to-day news, events and knowledge such as in newspapers to benefit Mathematics, or more documentary and discussive contents in magazines to benefit language (English). (The finding on magazines and English was also corroborated for the project school learners, but not the control school ones, during such comparisons, suggesting that the tutorial programme to some extent facilitated reading behaviour and/or the ability to derive appropriate benefits from it.)

Proximity to a public library did not matter for performance improvement over time. Neither did the reported visiting frequencies.

Time spending at home

Cell frequencies (response rates) and the structure of the data made it very difficult to analyse this aspect meaningfully across tutorial attendance levels and the study design as such. However, when calculating correlation coefficients at a global level for the full dataset, the following few significant observations, all at the 5% level of probability, were made:

- Learners who indicated that they spent more time on buying food or groceries for the family during the week and over weekends performed less well during the pre-tests for Mathematics and English, and also showed smaller improvements in English performance over time.
- Learners who said they had to do lots of home tasks, such as washing, during weekends also performed more poorly in English at the pre-test stage.
- The more time learners spent on homework in all their other subjects but Mathematics and English during the week, the better their English post-test scores were, and the more they improved between the pre- and post-tests stages in English.

The first two findings suggest that one should look out for overburdening learners with home chores to the detriment of their schoolwork. The second finding suggests that increased exposure and opportunity to write and read enhance English performance levels and improvement.

A very cursory glance at learners' preferences for types of TV-programme contents suggests, although some low cell frequencies may not always justify this strongly, that English performance improvements over time for the high-attendance groups goes along with preferring to view documentary and educational programmes, instead of soapies, sport and movies. With regard to not viewing sport or movies, but rather educational programmes, this trend was also observed with regard to the Mathematics improvement scores. Peculiarly, preferences for viewing comedy and cartoons were also associated with higher Mathematics improvement scores. However, correlation coefficients at the overall level for the full dataset did not bear out any of these, granted that different respondents got included, but only showed a strong correlation (at the 1% level of significance) between preferring to watch news and actuality programmes and the Mathematics post-test score, and a weak correlation (5%-level) between documentaries and educational programme preferences and the same Mathematics score.

Support with homework

No firm or consistent indications were evident that parental assistance helped learners in their school performance. A few of the exceptions could perhaps, given low cell frequencies in places, be:

- When someone else, and not the parent, assisted learners directly with doing their English homework, learner performance improved over time (suggesting that parents may not necessarily master enough of the learning area contents, but selected others may be good resource persons).
- The same applied regarding having someone else check learners' Mathematics and English homework.
- When parents or someone else helped prepare learners for their Mathematics tests and parents helped in preparing for their English tests and exams, learners' performance improvement was higher.
- When parents or someone else took follow-up steps on poor learner results for Mathematics, learner improvement over time was also greatest.

No strongly significant correlation coefficients were found to bear out any of the above at the global level for the full dataset.

Support and time use at school

Reported good order and discipline at school in English classes, especially in the low-attendance learner groups, was associated with greater English performance improvement over time. Correlation analysis and comparison of mean scores at the global level between the control and project schools revealed no other significant trends.

Reported levels of time loss in Mathematics and English classes did not appear to relate to gains in performance increases for the two learning areas (also across tuition attendance levels). However, correlation analysis at the overall level seems to suggest that time loss in Mathematics and English classes could be linked to learners' post-test performance levels for Mathematics (5%-level) and English (1%-level) respectively. Those learners, who had attended their tutorial sessions well, and at the overall level reported little loss of teaching time generally at school, were able to improve their English performance scores more than anybody else.

Rated reasons for time loss could not be linked systematically to learners' performance improvement.[22] (There are some indications, though, that learners reporting very low incidences of time loss at their schools because of reasons such as sport, the weather or school principal decisions, experienced higher score gains over time.)

The reported frequency of writing class tests (especially up to weekly) was, for high-attendance learners, related to their Mathematics score improvement. So even (for Mathematics improvement) were the number of times that learners wrote English tests and got feedback on that from the teachers. The reported frequency levels of feedback after homework, tests or exams were not related to any English performance improvements.

Having Mathematics textbooks for one's own use was associated with improved Mathematics performance in the group that had undergone tuition. However, at control schools, without the interventions, this fact did not make a difference to learners' Mathematics performance. This may suggest that something additional, such as a tutorial programme, was required to overcome the difficulties that learners may have had in deriving benefit from the textbooks they may even have had, and that regular teaching at control schools couldn't do. In addition, correlation analysis across the board showed only for English that possession of textbooks was associated strongly with English post-test scores and score improvements over time. This further corroborates the fact that there may be a closer interaction for Mathematics between having textbooks or not, as well as tutors/teachers to facilitate the transfer of learning area contents.

Support outside school (extra lessons)

Despite low frequencies of learners in many cells, undergoing extra classes after school seems to have been linked to higher improvements in their performance levels for Mathematics[23] (among learners with high levels

[22] This item also only covered Mathematics teaching time losses, rendering it of less value in the analysis of English performance.

of tuition attendance). There may have been some interference in ascribing the outcome of learner performance changes to the effect of the tutorial programme, as learners may also have included calculations about the extra tuition of the project here, as it was not excluded in the formulation of the item. Be it as it may, also looking at the overall dataset and comparing the mean Mathematics improvement scores of those learners who indicated never and quite often (more than once a week) attending extra lessons in Mathematics, only showed higher Mathematics improvement scores for the project group, and not the control group.

On this same point, even the reported attendance of extra English classes had this effect on Mathematics improvement for learners from the broader project group. This may be an exciting finding that suggests the transfer of conceptual and language skills to the better mastery of learning content in another learning area!

The duration of such lessons, attendance in a group or not, and the resulting group size, have all been interrogated, but cell frequencies and response rates did not warrant too detailed analysis, or conclusions. For Mathematics, though, it did appear as if the longer the recorded duration of a session, and attendance in a group (although individual lessons were the norm), and such group sizes being 12 or fewer learners (although bigger groups of more than 25 were the norm), had the best improvement effect. Again noteworthy is that the same parameters applied to undergoing extra English classes and improved Mathematics performance.

Future plans and aspirations

There was not enough variance in terms of the range of responses on learners' desire to complete matric, their rating of their chances of doing so, and their intentions to study further after school, to warrant further analyses. The level, up to which learners thought they would study, also had inconsistent links with performance improvements.

4.5.2 Parent variables

It should be granted that parental background and home circumstances are a few more steps away from the point of influence of learner responses to a school-based tuition programme. As such, one should expect even more inconsistencies among and fewer correlations in the findings. As an issue of return and completion rates, in addition, lots of data losses have also occurred all along, and often resulted in low cell frequencies.

Parent / caregiver qualifications

There were no consistent effects for Mathematics among project-group learners. Cell frequencies all tended to become low too. For English, there appears to be some indication that learners, whose parents (either their fathers or mothers, or male or female caregivers) had completed matric or some post-school qualification, experienced higher performance score increases than the rest. Low- and high-attendance learners did not differ either. In the full dataset, with larger frequencies, and across both project- and control-group learners, the finding remained valid for English, but was also largely evident for Mathematics. This finding suggests that parents with higher qualification levels exert a stronger influence on their children in terms of drawing down the benefits of schooling for them, than the tutorial programme would have done.

Frequency of parental contact with learners' schools was not consistently related to learner performance improvements after tuition, apart from some emerging trends to suggest this at higher levels of contact, say at a frequency of quarterly or more. Inspecting the full dataset for effects across the project and control learners yielded no additional information. As a result, it also did not make sense to study the nature of such contact further, although one trend that seemed to emerge was for the children of parents who reported receiving (and most likely noting the contents of) newsletters and report cards, to show increased Mathematics performance over time, suggesting those parents to be in tune with and support their children more. With regard to English improvement, not only the two factors mentioned, but also reportedly attending parent meetings and signing homework were linked more strongly.

[23] Not attending any extra English classes was related to the highest improvements in English over time. A reason for this may be that learners, who already considered themselves in control of their progress or other efforts to that end, did not engage in more opportunities.

Reading and literacy levels

The more parents read newspapers and magazines, the higher the improvement of their children's English scores was over time to the point after the tuition, especially when learners attended their sessions well.[24]

This effect also existed when parents reported frequent visits to the public library, and when both fathers (male caregivers) and mothers (female caregivers) separately reported increasing levels of reading ability.

The interesting thing is that by far most of these effects got confirmed when comparing mean scores in the full dataset, but only within the project schools, and not the control schools. The exception here is that it appears that either parents' reading or writing ability was associated with their children's Mathematics improvement over time in only the control schools. (This may signal the natural effects and support, unrelated to knowledge about and the contents of the experimental tuition programme, of more literate parents on their learners' general knowledge and school progress.)

When checking correlations in the full dataset, by far the most of the findings reported above were confirmed, especially those about the effect of parental reading ability and activity on their children's English performance levels as such. Parents' reading ability again was shown to be related to the improvement over time of their children's English scores.

There is clearly a strong influence when parents are able to read and write well and seem to convey the benefits of their own literacy levels and practices to their children in the situation of a literacy intervention.

Support from parents

A clear relationship could be observed between the time parents were prepared and reported to spend assisting their children with schoolwork and the learners' improvement over time in English.

With more help and support (especially helping with and checking homework, and monitoring results), in addition to score improvements over time, also came higher English marks as such (post-tests, full dataset).

The response frequencies and return rates were too low to investigate the effect of the nature of such help in more detail.

Ambitions and aspirations

Because almost all parents had the highest aspirations for their children to complete matric, and achieve after-school qualifications, and also considered their children able to do so, there was not much variance in the range of responses. Analyses would always then be inconclusive. It did seem, though, that those few learners in the low-attendance group and with parents having high expectations for them, almost always scored lower in the post-tests for Mathematics than before. The trend was similar for English, but not so pronounced. The data in this sense seemed to uncover parents' unrealistic expectations, as they were not able to see or be prepared to accept that their children were performing poorly, and potentially lacked commitment and ability. Also the levels of anticipated after-school studies did not form any consistent pattern with learners' current performance and achieved performance improvements.

The numbers of parents who themselves studied or planned to do so were too few to analyse in terms of any effects on the performance of learners or their progress in the tuition. Nevertheless, from the full dataset it seems that learners of more ambitious or active parents in this sense improved quicker, especially in Mathematics.

4.5.3 School context

At the school level, belonging to given schools appears to have had a direct effect on learners' ability to improve their scores, separately for the two learning areas, though. There was only one school at which both English and Mathematics improvements were consistently greater than the average. It was a control school.

[24] Low-attendance group frequencies were mostly too low to pick up any effects.

This fact points to the positive role of school management and infrastructure, or staff selection, ability and commitment levels in general, rather than or at least in addition to individual teacher abilities, skills and commitment, or the lack of it, across learning areas.

However, in some cases only English or only Mathematics improvement had been higher than the average. For Mathematics, it happened in one project and one control school each. For English it was the case in two project schools and one control school. Chances are that such occurrences are more closely related to either teacher factors, such as individual competency, ability or motivation, or learning area department factors, such as the role of heads of department, especially in mentoring, supervision, curriculum management, etc.

The final scenario is when neither of the two learning areas showed great gains, if any, and this occurred in one project and one control school. This could again signal greater measures of overall dysfunctionality at the school level over and above more individual teacher factors.

It is notable that there is no difference really in the performance gains because of belonging to either the project or the control schools sub-group. This would signal that school factors would be able to uniquely and strongly combine with teacher and other factors more closely linked to the learners and their parents to benefit learners, even independent of the benefits of a tuition programme.

Profiling schools in terms of the success or not of improving learner performance over time, resulted in a few observations about such potential contributing factors. Schools with consistent learner improvement over time were not as large, sported better physical conditions (such as the general appearance of premises, and the availability of running water, electricity, security fencing and burglar bars), teacher punctuality, and some degree of affluence (i.e., poverty index was not low at all). Broader facilities and equipment (such as offices, a staff room, hall, library and computer centre), and even curriculum management and assessment practices did not appear to make a difference. Care has to be taken not to generalise these findings too easily, as the sample was very small. Also, for a number of variables, especially those not mentioned, such as time-tabling practices and quality, and learner attendance registers, there was not enough variance to allow looking for differences.

4.5.4 Teacher and tutor factors

When comparing project-school outcomes against control-school outcomes with regard to the influence that learning area teachers had on learner performance, it became evident that there were equal numbers of teachers in both groups and for both learning areas of whom the learners either improved or deteriorated in terms of their performance over time. It was, as a result, and also because cell frequencies were too low allover, not possible to really isolate unique or different teacher factors that would apply in either of the two groups (control and project) to enhance or limit learner performance.

However, in the case of Mathematics it seemed evident that teaching fewer classes and a lower total number of learners, having better levels of equipment (textbooks, LTSMs, Mathematics sets, etc.), and following good curriculum management practices may give the teachers in any of the two groups a cutting edge in terms of learner performance improvement.

In the case of English, smaller class sizes, good physical conditions in classrooms, and good curriculum management practices in the same way got linked to potentially greater learner performance improvements.

Within the project group only, the mediation of high or low tuition attendance levels on the influence on learner performance improvements by factors pertaining to teachers and tutors could be inspected further.

Learning area teachers

The number of candidates per regular classroom teacher for whom tutorial attendance levels, and both pre- and post-testing scores were available in either learning area, became quite small, even once the new 82%-level cut-off point was implemented. To add to this, information completion was not at a good level (teacher questionnaires). As a result, trends would become very inconclusive quickly. It was clear, though, that irrespective of tuition attendance levels, the learners of at least one Mathematics teacher each respectively consistently achieved no change in their performance over time, or very low or no improvement, or high improvement. Factors that may be associated with the positive outcome could be acceptable levels of quality

and existence of conditions and equipment, and curriculum management and functioning. The data did not allow meaningful further exploration.

In the case of English, also because there were more teachers for language than for Mathematics, more information was available. The learners of at least three teachers each respectively consistently either achieved high performance improvement over time, or low, or no improvement. Factors that may be associated with positive outcomes could be smaller class sizes, acceptable levels of quality and existence of conditions and equipment, curriculum management and functioning, and good assessment practices, including regular assessment, the specification of assessment types, well-organised portfolios, and giving learners substantive feedback. The data did not allow meaningful further exploration.

The above findings do suggest that strong teacher factors could exist in that teachers were able to evoke their learners' potential to differing degrees.

Tutors

The mean difference scores between the pre- and post-test performance outcomes of learners for both English and Mathematics were also compared across tutors.

Again the consistency and completeness of data across pre- and post-tests, tuition attendance records, tutor identity and learning areas (and combinations thereof), rendered many cell frequencies quite low in view of the resulting complex configurations. This would again affect learners who had low attendance at their tuition sessions most. Nevertheless, some meaningful observations were revealed.

It does appear that learner performance over time either improved or deteriorated, but seldom stayed stable, when compared by tutor. This applied without exception to Mathematics, and with only one exception to English. This finding suggests that tutor factors such as approach/pedagogy, capacity, mastery of learning contents, and motivation may have been a deciding factor, rather than tutorial contents and learner factors, or at least have played a role in addition to the latter.

With regard to Mathematics, there were two schools where the learners of one and three tutors, respectively, found themselves in the groups that showed both increased and decreased scores from the pre- to the post-test, depending on their attendance levels. In the two remaining schools, the number of tutors was small (only one each), and the learners found themselves either in a deteriorating or in an increasing difference score situation. In the school with mixed learner results for one tutor, as mentioned in the opening line of this paragraph, there was also another tutor each whose learners either consistently improved above the average, or well below, if not deteriorating, irrespective of tuition attendance levels. Reasons for this are explored later.

English performance difference scores followed a related pattern, not necessarily overlapping with that for Mathematics. This suggests the strength of tutor factors above school-based conditions. The pattern was, as already indicated early on when the so-called difference-in-difference analyses were reported on, less positive for language. In the case of one school, the performance of the learners of all three tutors increased over time. In two cases, the improvements were quite large, although in one of them, there were signs that the low-attendance learners suffered (albeit a rather small sub-sample, casting doubt on the reliability of the finding). In two schools, various mixes of performance increases or decreases under low- and high-attendance conditions applied to the learners from one tutor each. In the final school, with three tutors, all the learners' performance in essence deteriorated, suggesting the presence of some school-level factors.

The information provided above can be summarised and schematically depicted as in Table 4.8.

Characteristics of Mathematics tutors potentially associated with learner performance improvements could not be explored because of poor data coverage. Pertaining to those English tutors whose learners had achieved higher improvement scores, it seemed to centre around better curriculum management, some assessment practices (feedback), and better physical conditions.

Another aspect to briefly comment on was the fact that in some schools the learners' own teachers were also the tutors, while in others this was not the case. There was too little evidence (essentially too few cases where this applied) to investigate if having their own classroom teachers as tutors, or not, made any difference to

learner improvement. For Mathematics, though, the learners of two of the three tutors who were not learners' own teachers, did not achieve performance improvements on par with those of other learners. This suggests some transfer of the everyday knowledge that teachers have about their learners' needs to the tuition situation.

Table 4.8: Learner performance over time by tuition attendance, learning area and tutor

Key*: *Maths* Eng School	Decrease in performance over time		Increase in performance over time		No change
	Low attendance	High attendance	Low attendance	High attendance	
S	***9112*** ***9112*** ***9111***		***9111*** ***112*** **121** **122**	***112*** **121** **122** **9121**	**9121**
M		**221** **223**	**221** **223** **222** ***213***	***213***	
B	**322** **321** **323** ***311*** ***313***	**321** **323** ***312***	***312***	***311*** ***313***	
Z	**421** **9421** ***9411***	***9411***		**421** **9421**	

* Underscored tutor identity numbers indicate consistently increased or decreased learner performance over time
(Mathematics teacher numbers are in Italics, English tutor numbers in normal type)

A final matter is the one of learners receiving tuition in one or two learning areas. Five possible combinations could apply across the four schools and two learning areas for any individual learner, although these were arranged in blocks, so to speak, according to the capacity of every school, and the number of learners volunteering. These combinations were:

- Mathematics (*Wiskunde*) tuition 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).

Pre- and post-testing languages corresponded with the tuition-language patterns above, and also followed learners' home languages and official languages of instruction.

With regard to the performance of learners on the Mathematics tests, all but the second of the five tutorial programme combinations occurred[25]. As with English (see next paragraph) those learners undergoing tuition in only one learning area, seemed to improve more. Although only consistently and strongly so in the case of Mathematics in Afrikaans (*Wiskunde*), also the few learners who had low Mathematics (in English) tuition attendance records improved well. Those attending well did not, but were very few, which may constitute an unreliable finding. As to those learners who participated in both tuition programmes, they either showed unchanged scores over time, or even decreased scores when attendance levels were low (but note that there were some low cell frequencies in the latter case).

With regard to the performance of learners on the English tests, the final four tutorial programme combinations occurred. It became clear that those learners who participated in only one (either Mathematics or English) tuition programme, showed consistent improvement over time. When learners undertook both the tuition programmes, only those who did Mathematics in Afrikaans improved, and not those who did so in English. This may either be a tutor effect or a learner home-language effect (which has been noted before), and which in this case only seemed to manage to partly overcome the burden of undergoing two tuition programmes.

The one common denominator seems to be that learners got overburdened when trying to participate in too many remedial activities at the same time. There was only one partial exception for the broad pattern where learners in single tuition programmes benefited more and those undergoing both tuition programmes did not.[26]

[25] Note that all learners were expected to complete both tests as far as possible, irrespective of their tuition group.
[26] Although the recovery plan of the Department, instituted after the teacher strike in the second term, potentially ran in parallel to the project intervention, it may either have helped learners, or hindered them through overburdening. It also may depend on how individual schools rolled out the plan in terms of grades and learning areas, or the winter holidays.

5

Discussion of the implications of the findings

In this final section, some synthesis is provided from the findings and other experiences gained during the study. This is mainly structured around the formulation of some key conclusions and a number of important implications that can be derived from them, followed by the recommendations flowing from all of these. To conclude, some reflections are made on future prospects based on the study's findings.

5.1 Conclusions

Measured against the central objective of the study, namely to establish through a demo/pilot research study whether Grade 8 learner performance would improve if more time was made available after-school through tutorial programmes (formulation shortened), the main observation has to be that no *consistent* link was found between learners receiving tuition and improving their performance over time.

"Consistent" was deliberately emphasised in the main conclusion above. The reason is that the study was as multi-dimensional and complex as the teaching and learning reality in schools, implying that many nuanced findings and conclusions did arise all along from the work. These are focused on some more in the rest of the section.

What is meant by all of the above, among other things, is that:

- patterns differed between the learning areas of Mathematics and English,
- overall performance gains in other learning areas would only be evaluated at later stages, when marks to common assessments across learners would become available at the end of Grades 9 and 12,
- patterns differed, also between learning areas, when comparing high tuition attendance levels against low attendance levels, and project-school outcomes against control-school outcomes, when attempting to isolate the effects of the interventions,
- learner performance improvements varied depending on demographic characteristics and contextual factors pertaining to learners, their parents, teachers/tutors, and schools, and
- the nature of the study, its design features (e.g., sample-size, numbers and sizes of sub-groups, and the number of variables) and the smaller than expected improvement outcomes, were conducive to limiting the degree of confidence with which one could ascribe any effects to the interventions.

The latter item, in the absence of obtaining clear increases of about 10 percentage points in a year's time on Mathematics, English and overall performance marks, means that increases of three to six percentage points, in conjunction with the analysis of interaction effects with tuition attendance levels and with contextual factors, would only in optimal cases enable one with 90% to 98% certainty, i.e., short of the ideal of 99% certainty, to ascribe the performance outcomes to the systematic effects of the interventions introduced and tested.

This is not to say that no meaningful trends at all were found. On the contrary, many observations indicated relationships that were in the expected directions. What is said is that we are not statistically confident that the conservative criteria of certainty we set ourselves, have been met. It therefore does allow some further meaningful discussion of the observed trends and findings, as there is always a theory-based or informed plausibility attached to outcomes such as these. These would normally be based on the experience of practitioners, administrators and managers, and academics in the field, and aspects of theory.

So, the next step would be to take stock of some of the findings that did occur with some consistency or certainty, and especially to try and grapple with the question about the conditions or circumstances under which any such plausible findings appear to have been emerging more strongly. Such a course would still allow meaningful discussion of what would be the likely situation, future prospects, etc.

A first finding, consistent across all four research pairs, was that higher learner attendance at Mathematics tuition sessions was always related to greater Mathematics performance improvements, and the inverse. Such consistency may lead one to trust that any improvements in the study, such as any or all of larger samples, better tuition-material design, more precise tutor screening and recruitment, improved tuition delivery, improved learner performance measurement instruments and the administration thereof, and many more aspects related to optimising research variance, controlling nuisance variance and minimising error variance, may enable coming to statistically significant conclusions against strict probability criteria.

One example of the interactive way in which the research process runs, is taken from a request by the research participants (workshop of 11 February 2008), after which it was explored whether a certain minimum level of mastery of learning area contents by learners would not be the key to their ability to benefit from tuition. However, further analyses found no trace of such a pattern where learners had to start from beyond a certain point before being able to capitalise on additional tuition. An initial finding was actually confirmed, in that learners benefit more strongly when they start off at poorer levels. Interestingly enough, the contrary may actually be suggested, in that once learners reached a certain ceiling close to where any foundational knowledge deficiencies would allow them to come, regular tuition may not be efficient any longer, as more remedial attention to earlier work would be needed. Be it as it may, one observation did become clear from the additional exploration. It is suggested that the lower a learner's baseline departure point would be, the better their attendance levels have to be for them to make any initial gains. Above a certain point, in this case just beyond the mean score of about 30% to 35%, attendance levels were not so critical any longer.

A second key discovery, for both Mathematics and English, is that project-school outcomes were not consistently better than control-school outcomes. However, some discussion has been had in the report so far of the cases / schools where it applied, and probable unique conditions for that to happen. For Mathematics, one outlier control school upset the pattern drastically, and for English, there were stronger indications overall of the benefits of tuition.

Leaving that there at some prevailing level of uncertainty, it makes sense, in the third instance, to inspect the plausibility that a number of other contextual or background factors, such as teacher skill and knowledge, school conditions, home background, parental support and related circumstances, the use of time, levels of discipline, exposure to opportunity to read and write, etc., may have contributed to dampen or facilitate the likelihood of the tuition programme rendering any benefits to the participating learners.

It also has to be acknowledged at this point that one would never be certain to what extent the teacher strikes and any subsequent efforts at remedying the situation by parents, teachers and children alike (including any formal recovery plans) would have had in overshadowing the study and its tuition intervention. A possible assumption that one could consider making, especially if the recovery plan was centrally developed and driven, is that the effects would be the same for the study's project and control schools. One would, however, first have to provide some evidence for such a position.

The additional conditions and circumstances mentioned earlier comprise a very wide array of potential effects, because teaching and learning occurs in an open system, as complex as one would care to imagine. Their influence could comprise any mix from the following:

- conditions and background pertaining to learners themselves (e.g., opportunity, motivation, ambition)
- conditions and circumstances pertaining to their parents or caregivers (e.g., SES, and direct support)
- teacher and tutor ability and motivation
- school infrastructure
- the tuition contents as such
- how the tuition programme got enacted (e.g., attendance, pedagogy, etc.)
- test and questionnaire contents and administration conditions.

A few of the near-significant and other plausible observations are briefly summarised next.

Factors associated with learner demographics and context that appear to enhance the chance of learners to benefit from tuition were:

- motivation level, also associated with the commitment coming with volunteering to undergo further tuition, with girl students having an edge over boys in this

- being appropriately aged (turning 14 in Grade 8)
- having more books at home of one's own or in general
- being exposed to increased opportunities to write
- having good access to Mathematics textbooks
- not being over-extended in terms of expectations to do home chores and shopping
- perceiving one's responsibility, and the actual behaviours of self and others, to be punctual and disciplined as important
- watching appropriate television content within measure (not too much time)
- availing oneself of the benefits of using a PC.

Parental background and factors that seemed conducive to benefiting from tuition were mainly:
- higher levels of support of their children with their schoolwork
- higher qualification levels
- improved/increased reading behaviours and opportunity
- higher levels of literacy (ability to read and write)
- general exposure to the world associated with higher socio-economic status.

The identity of the learning area classroom teacher did not have a strong influence above other more important factors, but at most pertain to teachers:
- exercising good curriculum management practices
- having to teach fewer classes and/or learners
- making use of appropriate learning support materials.

In terms of the tuition delivery and tutor characteristics, it was evident that the identity of the tutor either helped or hindered learners in making progress over time. Although background information was scant and somewhat inconsistent, the following became apparent:
- higher levels of attendance as such was conducive to higher benefits
- pursuing good assessment practices and feedback was beneficial
- sound levels of curriculum management were conducive.

At the school-level, it became clear that overall management and discipline would create a generally enabling environment, but that many factors related to the management of learning areas and departments, and at the level of teachers, learners and parents, would be strong moderators in this regard.

In terms of the comments made earlier in the section about the nature of the study, and the relationship between the empirical/statistical[27] and logical elements pertaining to making sense of the findings, and taking

[27] A brief comment on the reliability and validity of the findings of the study is in place here. Reliability is taken to refer to "doing things right" during the study. This would entail having instruments that consistently measure what they intend to measure over time, across test-administrators, and within themselves. As set out in various introductory and methodological sub-sections, care has been taken to select tested versions of especially the learner performance instruments, which even included a large number of items from the most recent TIMSS study, and had gone through intensive processes of evaluation before and during the Grade 8 evaluation study undertaken for the WCED in 2006. Internal consistency or Alpha coefficients of 0,899 for the English instrument and 0,900 for the Mathematics instrument were demonstrated during the 2006 administration of the original versions of the learner performance tests. The main other measure taken in this regard normally is to standardise administration procedures, which has also been described amply in the methodology sub-sections, and had been executed in line with a detailed administration manual and procedure, after thorough training of the various administrators in as far as possible. Reliability, as described above, is seen as a subset of or precondition for validity. Validity, in turn, is taken to refer to "doing the right things". Argument for having accomplished this is not normally found in statistical and other indices, but in the form of academic argument and discussion between experts, and would refer to aspects such as the content, construct, face and criterion-related validity of the techniques and procedures used. To this extent, the project's Steering Committee served the main purpose in ensuring that the right behaviours and constructs were included in all the research instruments and procedures, and that item formulations were appropriate. The significant correlations found during the present study between learners' levels of commitment to attend English and Mathematics tuition sessions, or between the levels of consistency to perform across learning areas would serve as partial confirmation of the validity of procedures and instruments. A final aspect is that the study sample should show correspondence to the target population. This has also been argued extensively in the methodology and design sub-sections. However, it has to be noted that the study, being of a pilot or demonstration nature, does not claim to have undertaken random sampling that would allow statistical generalisation to the full

them further, the debate is now shifted towards what the implications of all of the foregoing could be. In such discussions, any observations and viewpoints should be clarified critically between the main role players in the system of teaching and learning, and should cover operational, logistical, technical, professional, theoretical, disciplinary, administrative and managerial perspectives, to name the main ones, that concern stakeholder groups such as the learners themselves, parents, the community, teachers, principals, district and provincial officials, academics, and others.

5.2 Implications of the study

As argued up to this point, a creative tension exists in work like this – which is a mere reflection of the dynamics pertaining to the realities of teaching and learning in the school system – between what is practical and what is right/best/perfect.

Implications for implementation within the Department

The key implication is that Grade 8 is not the best level to focus on primarily or only. Enough indications are evident from the findings of the study to suggest that there are other role players and contexts, also and especially at earlier stages in the school career of learners, where attention should (also) be focused.

Formulating the implication in this way is supported by the findings reported above, especially of not being able to conclusively accept that the demonstrated or piloted tutorial programme consistently succeeded in learners improving their performance strongly over time, and of having to accept that many other parts of the teaching and learning dynamic and background had very strong effects. Therefore, the solution to improving low learner performance does not mainly or solely lie in presenting extra tuition at Grade 8 level, but probably both earlier in the process and also elsewhere/otherwise.

The essential content of this argument is twofold. In the first instance, by the time that learners end up in Grade 8 with such low marks as those observed in the study, or are unable to improve them substantively, such marks are not any longer only a reflection of having reached the ceiling of one's performance maximum, because of the limits imposed by one's ability, but also the result of having had that ceiling reduced by not achieving the required learning objectives during the earlier learning phases during which basic knowledge contents had to be mastered. As a result, many of the tools that learners needed to mine subsequent knowledge, had been blunted, damaged, lost or not provided in this way. This would apply within a learning area, but also in terms of transfer effects across areas such as from Literacy to others. The language tools are precisely the key instrument for unlocking further learning.

In the second instance, perhaps even more so under conditions such as those just mentioned, there would be an array of other dynamics and influences, partly evoked by the crisis situation one finds oneself in already, that would give excessive weight to factors other than the day-to-day learning and teaching events in the normal classroom. One here thinks of teacher overload, dejection and frustration at trying to first recover lost ground, and then to cover the prescribed learning contents. There would also be learner frustrations, both at the ends of more gifted learners being frustrated at the slow pace, and of those who have fallen behind at not coping any longer with new work. Various other pressures and expectations, even apathy, from parents would come into play. So would attitudes and thought processes within learners themselves. In general, accepting the abnormal as normal and by having been pulled into putting in lots of effort and energy where it is not productive, would undermine the benefits one could gain even by attempting to afford learners extra time on task through tuition, such as studied here.

Any eventual implementation of extra-tuition interventions would first have to evaluate contextual factors and other situational conditions pertaining to the intended delivery sites. Once that is understood well, some choices have to be made about the elements of the tuition approach that would be basic and common everywhere, and special foci or customisation for specific audiences. There appears to be no such a thing as a single solution for everyone, everywhere, at the same time. For a start, though, the key analysis would be if it is extra tuition that is called for, or rather different recovery plans to first normalise the situation sufficiently.

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population of Grade 8 learners in the Western Cape. It does, though, argue for and claim resonance with typical circumstances, conditions and dynamics in the broader population, rendering arguments and findings highly plausible.

It is clear that in an ideal situation, learners would have enough time, be motivated, have supporting teachers and parents, a decent background, good tutors, and well-structured, coherent and well-articulated tutorial contents, etc. However, this would very seldom apply yet, hence the need to put more flexibility into such ventures.

At each level, specific needs would have to be addressed and conditions factored in:

- At the level of parents, their ability to support (enable, motivate, supervise) their children is crucial.
- At the level of learners, the extent of the remediation and tuition required is key, within time and other activity and background constraints or enabling circumstances.
- At teacher level, the extent of support required or available, own conceptual knowledge levels, factors of time, capacity and workload, and learning area infrastructure and management are all important.
- At school level, the important factors are all of structural and managerial nature, and cut across aspects such as facilities, learning materials, time management, mentoring, workloads, etc.

One area where communication and consensus become critical, as discussed during feedback consultations, is discrepancies about how matters are understood and prioritised by the various levels of the system, namely at the provincial and district offices, and schools, particularly within classrooms. Whereas needs and obligations at the level of classrooms and teachers would centre around facilities, infrastructure, workloads, remuneration, capacity, learning support material, technology, assistance/assistants, discipline, and other day-to-day delivery issues, at other levels of the system the issues are policies and programmes, security, resource provisioning, large-scale logistics, and overall management, to name a few. The experience often is one of alienation and misalignment between the two sets of role players.

In conclusion, the problem of learner performance improvement has to be accepted as pervasive and very complex, much more so than a broad range of participants may have realised. As a result, realistic perceptions are required about the development, delivery and management of extra-tuition, which schools, teachers, parents and learners have to own to give it a fair chance of succeeding.

Implications for tutorial programmes such as the one piloted

Much of the basic thinking was most likely quite sound. The broader approach and structure to such an event could be retained, but requires much attention to a range of aspects such as the following:

- high minimum criteria and expertise for tutors, which may include assessment of their prior knowledge levels to ensure that they are well up to the task
- tutors internal *vis-à-vis* external to the schools
- the development and quality of only the best tuition materials
- training of tutors
- monitoring of tutorial delivery
- providing formative assessment tools as part of the tutorial contents to enable tutors to assess the progress of learners (and themselves) on the achievement of their objectives
- best duration, timing and logistics behind the tutorial programme
- focusing on a maximum of one learning area for extra tuition for any learner at a given time.

On the question about teachers as tutors, more debate may be required. On the one hand, there could be disadvantages. There may be a cap on the time end effort available from the side of tutors as teachers internal to schools. This may equally put a very firm ceiling on the extent of improvement that can be expected in learner performance. Such teachers could also be tempted to remain in previous ruts, and may take many things for granted, such as their intuitive, but untested, sense of what the learners' problems and needs are, and own sense of what a good work-rate is. There could also be the risk of slacking on day-time work on the realisation that an extra opportunity is created in the afternoon. They could also deliberately go slow in daytime to create an afternoon economy against additional reward, as already observed elsewhere in Africa. These last two matters may become severely counterproductive in terms of the initial idea of affording more time on task. However, on the other hand, there may by advantages. Teachers internal to the school may know the learners' needs very well, and have much diagnostic and other information on the areas of work not mastered well, learners not doing well, pacing, etc. Tutors from outside school, although lacking some knowledge about the intricacies within a given school, and perhaps being more expensive, may also bring about a new breeze of enthusiasm, high motivation, novelty, a good skills level, and dedicated effort, which would remedy the tight resource situation inside a school.

An implication commented on during one of the feedback opportunities, is that tutor delivery may be expedited by contracting tutors much more in terms of delivery or output, i.e., for example, making payments or bonuses dependent on certain levels of learner performance gain, than in terms of a required input, such as merely delivering 20 sessions.

A further matter would be to balance flexibility and standardisation with regard to tutorial material contents. The latter is required for the productive and efficient provision and distribution of a large core component by which also tutor preparation could be enhanced. However, the needs of individual schools and learners, depending on the extent of backlogs or remedial attention required, would demand some modular options, etc.

Implications for this and future research

As always, taking an in-depth look at phenomena has raised even more questions than answers.

This implies that stock has to be taken to some degree of what new has been revealed, what is commonly accepted, and which gaps remain.

The present findings are up for debate, so to speak, by everyone expected to see what gains can be made from them in terms of knowledge, practices and policies.

In terms of the latter, not unlike all other research, it is through policy debate that it is hoped that the influences and recommendations of this study will also filter through gradually into improved practices in many spheres.

5.3 Recommendations

What would the key recommendations from the study be?

To reiterate, the study cannot claim that the piloted intervention be rolled out in all Grade 8 classes in schools of the Western Cape and the country immediately. For that to have happened, the findings had to be very consistent, decisive and even revolutionary.

The first thing that is recommended is that similar interventions to the one piloted also be explored, developed and implemented at earlier levels of the schooling system.

The low levels of baseline performance in Mathematics and English among Grade 8 learners in the study, as well as many other indications in terms of the intervention not being able to realise larger learner performance improvements, support this call.

It is further recommended that a multi-pronged approach be followed, singling out both Foundation Phase (Grade R, and 1-3) and Intermediate Phase (Grade 4-6) interventions, with both of them interacting with Senior Phase (Grade 8) interventions.

As first emphasis, all Grade R and Grade 1-3 Literacy and Numeracy teaching and learning activities should be strengthened from as many angles as possible. The purpose is to ensure that “the basics” are covered successfully.

The most important aspect would be not to allow that any foundational knowledge and concept formation gaps develop during teaching and learning in the Foundation Phase. For this to happen, teacher capacity and qualifications, resource allocation, also to learning materials, and the early identification and remediation of problem areas and learners, all have to be aligned appropriately.

Parallel to this, a strategy and structures have to be developed and implemented at the Intermediate Phase level, with continued extra support given to learners newly discovered to be battling with learning contents for Numeracy and Literacy, and further remedial attention to avoid that learners enter the Intermediate Phase without having mastered Foundation Phase contents.

As a repeat of this strategy, but at the next interface level, being from Intermediate Phase to Senior Phase (Grade 7-9), new interventions and extra tuition should be developed and introduced as required, while continuing to remedially address the difficulties of learners still battling with learning contents from the previous phase.

It is recommended that a well-structured approach of twinning secondary schools with their feeder primary schools be set up, largely as a preventive strategy. This would have as purpose assistance of primary school teachers by secondary school teachers with a view to help the Foundation and Intermediate Phase teachers prepare learners for secondary school learning. Through this structured interaction the primary school teachers should be helped to identify the areas of work with which learners later typically battle, so that these receive due attention early on. Best-practice pedagogy could be fostered in this way. In addition, secondary-school teachers will also in this way help primary school teachers to identify areas and learners of concern, and how to remedy the situation, especially by providing those learners who are already in need for intervention at the Foundation and Intermediate Phase levels, with early intervention. The junior-phase teachers could also be assisted in how to develop and implement such interventions.

It should also be noted at this point that there may be alternatives pertaining to the delivery mode eventually adopted. After-hours tuition driven by the rationale of affording extra contact time may not be the be all and end all, especially if one talks about primary schools. Perhaps crucial decisions about the design and packaging (presentation) of such materials, in conjunction with extensive pre-training on how to use these to the regular primary school teachers (become tutors) or other assistant staff, who would be responsible for implementation, is a very promising way to go. This would serve the rationale of working smarter, rather than more or harder.

Should teacher (re)skilling be required at the Foundation and Intermediate Phases, this should also be identified and addressed at this stage.

Without spelling out any details at deeper levels, as this would be an operational matter for teachers, learning area advisors and the departmental officials concerned, an integrated approach and network of systems and structures should be established to achieve across-phase continuity.

Crucial for all of the above to happen, is that teaching time, teacher capacity, and learning materials should in no ways be compromised in the Foundation Phase. No learner should be allowed to come through this phase still not being able to read and write fluently. The one bar (or what is expected from learners) that also has to be raised, is the volume of opportunity and exposure to practicing reading, writing, speaking and numeracy skills. A consistent finding across related research is that learners to not produce enough extended work of their own from early on and throughout their school careers.

Essentially, the focus is on the integrative features of such a strategy, to ensure smoother flows and transitions, including both forward-looking expectations and backwards-looking evaluation, between Foundation, Intermediate and Senior Phase learning (and even further and higher education throughputs).

Further practical matters that would require attention may include:
- Keeping interventions as indigenous to schools and teachers as possible (otherwise lots of implications may arise pertaining to capacity and funding).
- Developing Grade 3, Grade 6, and Grade 9 exit and entry quality control procedures, instruments and standards.
- Guarding against creating an inefficient afternoon economy.
- Addressing incentives and remuneration with honesty.

It is also recommended that continued research, evaluation and debate be accepted as the normal *modus operandi* to underpin further activities in this regard.

The strategies and actions recommended above should articulate well with and within integrated numeracy and literacy development strategies spanning from Grade R to 12, including throughput matters into Further Education and Training (FET), Technical and Vocational Education and Training (TVET), and Higher Education and Training (HET).

Any further debates on and implementation of matters pertaining to the improvement of learner performance should accept that this work takes place in an open system, within complex processes, towards far horizons, on the back of severe backlogs, within integrated strategies.

5.4 Whereto from here?

An ongoing process of discussion, reality checking, building out the implications, adding to or refining the recommendations, and further communication and dissemination of the findings, also through professional journal articles, are foreseen.

In fact, such a process started with and has continued right after the final presentation of the draft report and its findings to senior management officials from the Western Cape Education Department on 23 April 2008. As a result, some indicated changes were effected to the draft report, such as an expanded Executive Summary, and changing or adding a few formulations. This final draft was then submitted to the Department on 29 April 2008, and reviewed by appropriate research officials. The resulting feedback is being attended to already, and this process includes two important notes made on the next page with regard to proposed follow-up work and studies.

The current report is seen as the official deliverable in terms of the trilateral agreement between the funding organisation, research institution and client organisation.

Making further submissions and presentations to the Department is not excluded from the above.

As with all studies, also this one has had its limitations. It could and did not control for tutorial content quality. It also did not set minimum expertise levels for tutors. It may have better standardised and brought under central control the training and the administration of assessment tests and contextual instruments. The study (interventions) got interfered with potentially by the aftermath of labour action, in the form of recovery plans. The latter could not be controlled for, although initial notions are that the one school, where this would have the greatest effect, withdrew, and also, that recovery at Grade 8 level was not as severe an issue as it was at Grades 11 and 12, where most of the recovery effort was focused. General notions are that lost Grade 8 work got caught up more easily during the preceding winter holiday, or gradually within the remainder of the teaching time for Terms three and four.

The mere choice to have the study in the form of a pilot or demonstration project, almost as action research, brought a range of compromises of their own between various deliberated ends on continuums, as amply related at the outset of the report. These decisions restrict and enable in many senses the making of certain but not of other conclusions. Also these outcomes have been referred to sufficiently in the rest of the report, especially through the way in which the findings got presented and reported.

There may be a lot of sense in continuing to collect the post-study Grade 9 and Grade 12 learner marks in as much learning areas as would be available in another year and three years time from the Department through their CEMIS and other records, as envisaged. This would entail a rather small expense for quite a good gain in terms of learning something about the longer-term effects or sustainability of the interventions by tracking the learners from both the project and the control schools for a while.

Separate proposal options exist for these, and the outcome would form part of the decisions by the funding organisation in discussion with the research organisation and the Department at an appropriate point. As stated in these documents:

> "Ideally, comparisons should show an increase (or a maintained level) of learner performance of about 10 percentage points more for learners from the tuition group compared to those from the control group.
>
> The present cohort of participating Grade 8 learners for 2007 will progress through Grades 9 to 12 during 2008 to 2011.
>
> Should one want to make use of performance outcomes that would be identical for all learners, it makes best sense to collect their end-of-year Grade 9 (2008) common exit exam marks … early in

2009, and similarly their matric results for 2011 early in 2012. It is assumed that the CEMIS system would enable drawing on these records easily. As a result, costs can largely be limited to the labour time of the research team."

Two additional potential follow-up projects were envisaged and communicated during the official submission of the final draft version of this report to senior managers from the WCED on 23 April 2008. These were:

- Replicating, in appropriate ways and on an appropriate scale, similar after-school tuition interventions and evaluations at the Foundation and Intermediate Phases. This could ideally be done in either Grade 2 or Grade 3 in the former case, and in any of the grades in the latter instance, depending on the selection of the grade level for the Foundation Phase. Such a study would be able to investigate hypotheses around the best level of entry with a view to interventions promising optimal outcomes in terms of learner performance improvement. However, on review of the final version of the manuscript of this report, the relevant officials from the Western Cape Education Department already gave indications that this option would be difficult to support at this point. The main reasons for this would be that adding on to allocated teaching time may be very stressful for the learners, create complications around transport, safety and nutrition, and add to the sense of schools becoming "over researched". The latter would apply in particular when acknowledging the Curriculum Branch's current attention to further standardisation in the Foundation Phase of Numeracy content and delivery, which may be followed even by Literacy.
- Investigating in more depth and even in more qualitative ways the difference in dynamics and factors between schools respectively having been able to and not been able to show learner performance improvement over time.

In addition to these initial two themes proposed by the HSRC, Department officials (on review of the final report manuscript) also proposed that funding be sought for and proposals be prepared on the following three:

- 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.

It was agreed that the HSRC, through and with inputs from The Shuttleworth Foundation, would in due time prepare brief proposal outlines pertaining to the follow-up work envisaged above and enter into further discussions with the WCED.

As argued in the articles from *Sunday Times* (13 January 2008), already cited, one thing that remains is to again remind ourselves about the size of the problem, the complexity of the teaching and learning system, and the patience and dedication required over a long time hence to meet the challenges.

Annexure 1

PROCEDURES FOR ADMINISTRATION
"PlusTime" Project

Purpose: To provide orientation to everyone involved in the Project baseline survey administration
Participants: Principal and 2 educators from each of 4 project schools and 8 control schools
Date, venue and time: Wednesday 30 May 2007, EMDC Metropole-South, from 14:45
(With some pre-meeting activities with EMDC office staff.)

{Assumption: For efficient progress at the 30 May 2007 meeting, this document has been pre-distributed to and read beforehand by the coordinator-educator participants from the schools.}

I. INTRODUCTION

1. Background to the project

Joint introductory comments and provision of core information.

- The Shuttleworth Foundation (commitment of funding)
- WCED (Research and Curriculum support)
- EMDC (Accommodation and support of project)
- HSRC (Project diagram and design)

Broad outline of envisaged time schedule:

Period	Activity
Wednesday 30 May 2007	Orientation of participants regarding required activities
Thursday 31 May 2007	Distribution/completion of consent forms (& Commence with completion of first baseline instruments)
Friday 1 June 2007	Retrieval of consent forms Baseline survey, reviews, assessment (instrument completion) Distribution of rest of parent and other questionnaires
4-6 June 2007	Complete all the baseline survey, review, & assessment Completion of tuition materials, and distribution arrangements Tuition programme starts where feasible
7-8 June 2007	EMDC retrieve all materials and forward to HSRC Tuition programme commences at remaining sites
11 June – end of Sept 2007	Tuition programme is executed Recording of learner attendance Recording of tuition contents
September 2007	Return of attendance and tuition records to HSRC
Sept – Nov 2007	HSRC analyse data and prepare report
Nov 2007	Feedback workshop HSRC complete report

II. EVALUATION PROCEDURES

Orientation of participants regarding required activities (30 May 2007; 14:45 – 17:00)

1. Determining or selecting the sample (respondents)

Project schools (4)	Control schools (8 > 4 *)
Only Mathematics tuition: about 25 learners per school (1 tuition class at each school) Only English tuition: about 25 learners per school (1 tuition class at each school) Both Mathematics and English tuition: about 50 learners per school (2 tuition classes of 25 learners at each school) Resulting total: about 100 learners per school These learners were pre-identified in response to an open invitation by the Metropole-South EMDC to the 4 selected schools. Learners had to volunteer, and the relevant participation lists of learners are being/were compiled by the schools and the EMDC office (against learners' unique CEMIS numbers)	School sample: Eight initially, for purposes of obtaining comparative baseline information, and enhanced matching of four sets of project and control schools. ***** Learner sampling: A random sample of about **100** learners from those who volunteered from each control school. o **Procedure** (formula) = divide total number of (volunteer) learners on all the Gr 8 classlists by **100**. o Round the answer up (e.g., 2,4 < 3) to give "n") Then select every "n"th (or 3rd, in this case) learner from the classlists sequenced one after another. o Replace an absent learner with the following one on the list.

***** *After a matching procedure, four baseline survey control schools will be selected, and four dropped. Only the former 4 will be involved later in post-tuition programme monitoring.*

2. Administration of completion of **consent forms**

In all cases, the first two information-sheet pages are separated and kept by the respondent. The signed third page is returned.

The lists compiled to reflect the names of the sample of participants should be used to record, per individual, the fact that consent has been given. Only then can the research instruments be distributed/completed and/or collected. (Allowing for some "parallel processing".)

These signed consent pages should then be batched and returned to the HSRC team for record purposes and verification of ethical conduct, if required.

Form for	By whom	How
Parent consent (for self) and assent (for their child) [on the same form]	The coordinating Maths / English teacher per school	o Establish the volunteer learners' names from the pre-compiled lists, and ask them to take the form home for completion, and return it the next day. o Forms are available in Afrikaans, English and isiXhosa, and learners should receive the language version appropriate to the parent's home language. Only one of the parents or official guardians need to sign it. o Learners may help parents to complete the forms (e.g., by reading and explaining items and recording the parents' responses). (***NOTE**: It will help if learners also look up their Grade 7 report card marks at home and bring these along to school the next day to be able to complete the relevant question in the Learner Questionnaire*.)

Form for	By whom	How
Learner	The coordinating Maths / English teacher per school	o Learners can participate in the study only once parental assent (as above) has been given. o Establish the volunteer learners' names from the pre-compiled lists, and give each of them their personal consent form for completion. o Forms should be issued in either Afrikaans or English, corresponding to their individual official LOLT. o Suggestion: if learners struggle with completion, it could be managed as a group session (e.g., a teacher reads through the two pages, and deals with uncertainties). *However, consent is always an individual decision, and no coercion should happen.*
School Principal	EMDC project manager (MvdB), or HSRC team #	o The 4 project school and 8 control school principals have to receive, sign and return their personal consent forms.
Teachers for English and Mathematics		o All the Mathematics and English educators of those Grade 8 learners participating in the tuition programme(s), or the control school baseline survey, have to receive, sign and return their personal consent forms. o This fact again has to be recorded against the/a relevant checklist, and the signed forms returned to the HSRC.
Tutors for English and Mathematics		o All the tutors for Mathematics and English after-school classes to the Grade 8 learners in the four project schools have to receive, sign and return their personal consent forms.

Best logistical and resourcing procedures finalised at 25 May meeting and at 30 May 2007 orientation.

3. Learner, teacher, tutor and parent **linkage forms**/information

The success of the project is largely dependent on keeping track of **every piece of data** for every respondent, especially in terms of how various levels of information are imbedded within or linked to data from other levels.

For this reason, **learner and parent data** (completed questionnaires, and or assessment tasks) have to carry the same unique ID number. This is best done by applying the learner's unique CEMIS number to every relevant instrument.

Learner-educator-tutor linkage information: We always have to know who the Mathematics and English teacher(s) and tutor(s), where relevant, of every participating learner are. This is best recorded in (a) dedicated column(s) on the pre-compiled volunteer learner class lists. #

Because of the small sample, linkage to unique **school ID** numbers will not be difficult, as long as a note is made on every class, teacher or tutor list of the name of the relevant school.

Classroom-level document review will always be linked to the relevant **educator** and his/her assigned unique number.#

Best procedure finalised at 25 May meeting and at 30 May 2007 orientation. (Options are that either HSRC or the EMDC/schools prepare these dedicated templates and lists. Avoid duplication. EMDC's/schools' trusted procedures should suffice.)

4. Administration of **baseline survey instruments** and **learner assessment tasks**

Instrument	By whom	How
Mathematics assessment [Time required: about 60 to 70 minutes] **NB! – No booklets should be copied, removed or kept by the school or any individual, or any contents be made known. Determining the effect of the tuition programme depends on this.**	Coordinating Mathematics teacher per school	o Establish the volunteer learners' names from the pre-compiled lists, and let them get together in the venue(s) and at the time(s) that the school can accommodate. o This will depend on the school's programme and facilities (availability of hall or classrooms). o Note: This will also depend on the fact that some learners have to participate in the **English** assessment task as well. o (For example, all 25x3 learners undergoing Maths tuition can be treated as a single group at some point.) o Learners complete the Afrikaans or English version of the test according to their LOLT. o Make sure that the unique CEMIS ID number for every learner is applied on their booklets. o The coordinating educator takes them through the test precisely according to the instructions in the assessment booklet. o *[Also remember to accommodate the procedure for completion of the Learner and Parent Questionnaires below.]*
English assessment [Time required: about 60 minutes] **NB! – No booklets should be copied, removed or kept by the school or any individual, or any contents be made known. Determining the effect of the tuition programme depends on this.**	Coordinating English teacher per school	o Establish the volunteer learners' names from the pre-compiled lists, and let them get together in the venue(s) and at the time(s) that the school can accommodate. o This will depend on the school's programme and facilities (availability of hall or classrooms). o Note: This will also depend on the fact that some learners have to participate in the **Mathematics** assessment task as well. o (For example, all 25x3 learners undergoing English tuition can be treated as a single group at some point.) o All learners complete only an English version of the assessment. o Make sure that the unique CEMIS ID number for every learner is applied on their booklets. o The coordinating educator takes them through the test precisely according to the instructions in the assessment booklet. o *[Also remember to accommodate the procedure for completion of the Learner and Parent Questionnaires below.]*
Learner Questionnaire [Time required: about 45 minutes]	Coordinating Mathematics and English teachers per school together	o Establish the names of the volunteer learners, who are on the Mathematics and/or English tuition programmes, altogether about 100 per school, i.e., 25x4, from the pre-compiled lists, or the sample of about 100 from the control schools. o Let all these learners get together in the venue(s) and at the time(s) that the school can accommodate. o Make sure that the unique CEMIS ID number for every learner is applied on their questionnaires. o Also confirm that the learners understand the two minimal instructions for completion well. o Ensure that the biographical details are as complete / correct as possible. The questionnaire is of self-report nature and learners should be able to complete it easily on their own, but perhaps a group-session is advisable. (I.e., the teachers take them through the instrument together.)
Parent Questionnaire [Time required: about 30 minutes]		o A parent questionnaire can be handed to each learner at the end of the previous session, or linked to its administration procedure. o Make sure that the unique CEMIS ID number for every learner is applied to this questionnaire before they leave. o The questionnaire is of self-report nature, short and not complicated. o Although parents should be able to complete it easily, learners can be asked to assist their parents if necessary. (I.e., they can read the questions to the parents and record their answers for them.)

Instrument	By whom	How
Educator Questionnaire [Time required: about 45 minutes]	The EMDC Programme Manager, or HSRC Team members, as arranged #	o Identify all the Mathematics and English educators and tutors of every learner who participates in the Mathematics and/or English tuition programme. o Provide them each with the relevant questionnaire. o The questionnaire is of self-report nature, self-explanatory, and should be completed easily. o Arrange for collection of the completed questionnaires.
Tutor Questionnaire [Time required: about 50 minutes]		
School Observation Schedule [Time required: about 30 minutes]	HSRC team members (with some EMDC assistance)	o Make an appointment with each of the principals of the four project and eight control schools. o Complete the information that should be obtained from the principal. o Arrange to be shown the facilities and other aspects that the reviewer has to gather information on. o Return the completed schedule to the HSRC (through the EMDC) project leader.
English Classroom Document Review and Observation Schedule [Time required: about 45 minutes]		o Make an appointment with each of the educators of every learner who participates in the Mathematics and/or English tuition programme in the four project schools and the learners sampled from the eight control schools. o Complete the information that should be obtained from the educator. o Arrange to be shown the documents and other aspects that the reviewer has to gather information on. o Return the completed schedule to the HSRC (through the EMDC) project leader.
Mathematics Classroom Document Review and Observation Schedule [Time required: about 45 minutes]		

Best logistical and resourcing procedures finalised at the 25 May meeting and the 30 May 2007 orientation.

5. Administration of **tuition monitoring instruments**

Instrument	By whom	How
Learner attendance record	Tutor	Excel Spreadsheet will be developed and provided by the HSRC. Completed per session per learner.
Tuition programme contents per session	Tutor	Excel Spreadsheet will be developed and provided by the HSRC. Completed per session.

6. **Distribution of materials** to schools

A summary/checklist of the materials handed over to every school on 30 May 2007 is completed for record purposes. Returns of materials will have to be checked and verified against this after the Baseline survey.

III. TUTORIAL MATERIALS

The EMDC Metropole-South Project Coordinator (Mr Milton van der Berg) oversees the compilation, production and provision of the Mathematics and English tutotial materials, as well as the related implementation process.

Annexure 2

Reports on matching of project and control schools

After the first stage of matching at 23 November 2007

Pair S:[28]

Aspects with a very good fit	Aspects with an average to poor fit
School context	
o Language of Instruction (Afr & Eng for both) o Gr 8 learner numbers between 210 & 270 o Learner:teacher ratio very close to 30 o Physical condition of premises – both good o Condition of facilities / equipment – both average [around 2.5 on 3-point index] o Teaching time / punctuality – 3 & 2.8 out of 3 o Time tabling – both highest ratings possible o Registers and records – both very high o Maths curriculum & assessment functioning – both very high o English curriculum & assessment functioning – both very high	o Overall size (C is 66% the size of P) – [769 vis-à-vis 1155] o Same difference for number of staff [27 & 37] o Matric 2006 passrate for C unknown [P – 72%] o Poverty index [C = 5; P = 3] *It seems as if community poverty/affluence did not impact on aspects of functioning and condition at the school (see constructs reported left – no difference)* It would be good to have known C's passrate **No apparent problems so far regarding this pairing**.
Maths classroom / teacher context	
o Observed physical conditions slightly better in P (2.5) than in C (2.2) (3-point scale) o Observed condition / absence of equipment slightly worse in P (1.5) than in C (1.8) o Discipline in classrooms the same (average to good at 2.5 on 4-point scale)	o Observed Maths class sizes (P smaller at 35 compared to 45 of C) o Learning programme and curriculum management and documents worse in P (0.4) than in C (1.0) – (this could be caused by inter-rater variance?) **Extent and contents of the two observed differences are not such that they are very worrying.**
English classroom / teacher context	
o Learning programme & curriculum management and documents rather good at both (0.9 to 1.0 out of 1)	o Observed English class sizes (P smaller at 38 compared to 45 of C) o Observed physical conditions better in P (2.9) than in C (2.0) (3-point scale) o Observed condition / presence of equipment better in P (2.5) than in C (1.8) o Discipline in classrooms average in P (2.0) but good in C (3.0; on 4-point scale) **Condition of facilities and equipment and classroom overcrowding could be to the detriment of C, and thus have influenced the ability to roll-out and benefit from the tuition programme. However, no better match was possible (having looked at relevant data) with any of the discarded control schools. (See conslusion.)**

[28] P hereafter refers to the project school and C the control school in each research pair.

Annexure 2 (continued)

Reports on matching of project and control schools

Pair M:

Figures below reflected only C's position (so long); owing to P's late submission of information. (No baseline school-observation data for P had become available as yet.)

Aspects with a very good fit	Aspects with an average to poor fit
School context	
o Language of Instruction (both Afr@Eng) o Gr 8 learner numbers - unknown o Learner:teacher ratio - 28 o Physical condition of premises – very good o Condition of facilities / equipment – very good [3 on 3-point index] o Teaching time / punctuality – 2.8 o Time tabling – highest possible o Registers and records – very high o Maths curriculum & assessment functioning – very high o English curriculum & assessment functioning – very high	o Overall size (C = large school) – [1230] o Number of staff [44] o Matric 2006 passrate for C = high [93%] o Poverty index [C = 5; P = 3] *Relatively high difference with S more affluent.* Functioning of and conditions at school are at high levels (see left) **Abided by the conceptual pairing for the time being**.
Maths classroom / teacher context	
o Observed physical conditions at C (2.9) o Observed condition / presence of equipment average (1.8) o Discipline in classrooms good (3.0; on 4-point scale)	o C has large observed class sizes (54) o Learning programme and curriculum management and documents average to good (0.7)
English classroom / teacher context	
o Observed physical conditions at C good (2.9) o Observed condition / presence of equipment average (1.8) o Discipline in classrooms average (2.0; on 4-point scale)	o C has large observed class sizes (44) o Learning programme and curriculum management and documents average to good (0.7) **Abide by the conceptual pairing for the time being**.

Annexure 2 (continued)

Reports on matching of project and control schools

Pair B:

Aspects with a very good fit	Aspects with an average to poor fit
School context	
o Language of Instruction (Eng only for both) o Overall size (rather same) [P = 828; C = 1072] o Gr 8 learner numbers between 165 & 185 o Number of staff [33 & 37 (for P & C)] o Learner:teacher ratio quite close [25 to 29] o Poverty index [P = 2; C = 3] o Physical condition of premises – both average at about 2.5 out of 3 o Time tabling – close (at 1.0 and 0.8) [out of 1] o Registers and records – both very high o Maths curriculum & assessment functioning – both very high [1.0 and 0.9 out of 1] o English curriculum & assessment functioning – both very high [1.0]	o Matric 2006 passrate higher for P (84%) compared to C (59%) o Condition of facilities / equipment – P somewhat better at an average 2.7 than C at a poor 2.1 [on 3-point index] o Teaching time / punctuality – P = higher at an average 2.5 than C at 2.1 (poor) *Some academic functioning and results seem to be slightly higher at P than C (passrate, keeping teaching time intact)* *P has slightly better facilities and equipment* **Pairing: Apart from the two or three issues raised above, reflecting moderate differences only, there was very little else to discern between the two schools.**
Maths classroom / teacher context	
o Observed physical conditions same at about 2.6 at both o Observed condition / absence of equipment same at both at 1.8 o Learning programme and curriculum management and documents good (same) at both at around 0.9 to 1.0	o Observed Maths class sizes (P larger at 55 compared to 46 of C) – *but still both fairly large* o Discipline in classrooms average (2.0) at P but good (3.0) at C **No serious concerns about any potentially very different impact of the two issues above on tuition roll-out or uptake at the respective schools.**
English classroom / teacher context	
o Observed English class sizes (P very slightly larger at 53 compared to 50 of C) o Observed physical conditions same at about 2.2 at both o Observed condition / absence of equipment same at both at about 2.0 o Discipline in classrooms average to good at 2.5 for P and at 3.0 for C	o Learning programme and curriculum management and documents below average at 0.4 at P, but good at 1.0 at C **No serious concern about a potentially very different impact from the issue above on tuition roll-out or uptake at the respective schools.** **Also, inspection of the data of the discarded schools could not produce a better match.**

Annexure 2 (continued)

Reports on matching of project and control schools

Pair Z:

Aspects with a very good fit	Aspects with an average to poor fit
School context	
o Language of Instruction (Eng only at both) o Overall size (rather same) [P = 1177; C = 1376] o Poverty index [both very low at 1] o Physical condition of premises – both average to good (at around 2.75 out of 3) o Condition of facilities / equipment – both average to low [at around 2.3 on 3-point index] o Teaching time / punctuality – both average at 2.5 o Registers and records – both very high o Maths curriculum & assessment functioning – both very high o English curriculum & assessment functioning – both very high	o Gr 8 learner numbers high at P (287) and low / dwindling at C (96?) o Low number of staff at C [29] – compared to 40 at P o Result in higher learner:teacher ratio of 41 at C compared to more average 34 at P o Matric 2006 passrate for C unknown [P – 74%] o Time tabling – C = 1 (highest possible); while P = 0.6 (average to low) *Most conspicuous difference could lie in overcrowding and resulting lack of more individual attention at C (larger learner:teacher ratio, and fewer teachers). However, the tutorial dynamics deliberately controlled for this.* Would be good to have known C's passrate. **There were not many unmatched aspects, though (two alternative schools available both would have been a poorer match altogether).**
Maths classroom / teacher context	
o Observed Maths class sizes (P very slightly larger at 50 compared to 48 of C) o Observed physical conditions same at about 2.6 at both o Learning programme and curriculum management and documents good (same) at both at around 0.9	o Observed condition / absence of equipment poorer at P (1.6) than at C (2.2) o Discipline in classrooms good (3.0) at P but average (2.0) at C **These aspects were few and did not differ that much anyway.**
English classroom / teacher context	
o Observed English class sizes (P very slightly larger at 49 compared to 48 of C) o Learning programme and curriculum management and documents good at around 0.7 to 0.9 o Discipline in classrooms average (2.0) at both	o Observed physical conditions average at P (2.1), but approaching good at C (2.7) o Observed condition / absence of equipment poorer at P (1.8) than at C (2.2) **Differences were few and not that large. (Also no better matches were possible from discarded control schools.)**

Annexure 2 (continued)

Reports on matching of project and control schools

After the second stage of matching at 3 December 2007

Aspects with a very good fit	Aspects with an average to poorer fit (exceptions)
Learner profiles (Questionnaire)	
o Biographical information: language-related aspects, gender, etc. o Access to school: how getting there, late coming, time and distance from school o Facilities at home: water, electricity, appliances, bedroom, work and study space, etc. o Reading opportunity: own and family books, reading newspapers and magazines, library access, etc. o Time use at home: on school work, TV, reading, visiting, doing chores, etc. on week and weekend days o Support by parents with homework: almost without exception o Time on task / usage and discipline at school: largely consistent o Assessment and feedback frequency: largely same o Textbook provision: largely same o Extra classes: Maths and English o Future and career plans: aspirations for completing matric; fact and level of further study	o Access to school: Only for Pair S slight difference in distance and time from school (control = further). o Reading opportunity: distance to public library larger for control school in Pair S o Time use at home: Week and weekend days - In Pair S project > control for TV and visiting friends; latter also in Pair Z; in Pair Z, Zn weekdays, project > control in doing Maths and English schoolwork o Support by someone else than parent: for Pair S occurred more in control school o Time on task / discipline: In Pair S some aspects of discipline is weaker in control school; and some teaching time loss bigger (Maths, learner late coming, weather-related, etc.) o Textbook provision: better for project in Pair S for Maths **The isolated range (constructs and cases/schools) and extent of differences were no cause for concern.**
Parent profiles (Questionnaire)	
o Biodata: largely congruent o Qualification level: largely congruent o Contact with school: largely same extent; nature of contact varies erratically here and there because of low frequencies of respondents in some cells o Reading exposure (newspapers, magazines, library), ability and learner support: within-pairs patterns are very similar, although between-pairs levels vary largely o Future aspirations for their children: similar and very high throughout (matric and post-matric)	o Home language: some Xhosa is also spoken in control community in Pair S; more English is spoken for project school in Pair M o Qualification level: In Pair M, control school male and female parents have slightly higher level o Contact with school: in Pair M for project school and in Pair B for control school contact is more o Reading ability (fathers): In Pairs M and Z the control school parents were slightly better off **Extent and contents of the few observed differences were not such that they were very worrying.**

References

Heugh, K. 2006. Without language everything is nothing in education. *HSRC Review*, **4(3)**, 8-9.

Howie, S. 2002. *English language proficiency and contextual factors influencing Mathematics achievement of secondary school pupils in South Africa*. Enschede: Sarah Howie (Doctoral thesis, University of Twente).

Howie, S., Venter, E., Van Staden, S., Zimmerman, L., Long, C., Scherman, V. & Archer, E. 2007. *South African children's reading literacy achievement: PIRLS 2006 Summary Report*. Pretoria: University of Pretoria.

Reddy, V. 2006a. *Mathematics and Science achievement at South African schools in TIMSS 2003*. Cape Town: HSRC Press.

Reddy, V. (Ed.) 2006b. *Marking matric: Colloquium proceedings*. Cape Town: HSRC Press.

Reeves, C., Heugh, K., Prinsloo, C.H., Macdonald, C., Netshitangani, T., Alidou, H., Diedericks, G.A.M. & Herbst, D.L.) (In process/2008). *Evaluation of literacy teaching in the primary schools of the Limpopo Province*. Pretoria: Human Sciences Research Council.

Reeves, C. & Muller, J. 2005. Picking up the pace: Variation in the structure and organization of learning school mathematics. *Journal of Education*, **37**, 103-130.

Taylor, N. (Forthcoming). *Equity, efficiency and the development of South African schools*. In T. Townsend (ed.), International handbook of school effectiveness and improvement (pp. not known yet). Dordrecht: Springer.

Taylor, N., Muller, J. & Vinjevold, P. 2003. *Getting schools working: Research and systemic school reform in South Africa*. Cape Town: Pearson Education South Africa.

Taylor, N. & Vinjevold, P. (eds) (1999). *Getting learning right: Report of the President's Education Initiative Research Project*. Johannesburg: Joint Education Trust.