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## **Implications of conducting naturalistic research in multiple sites**

**Mary Delfin Pereira**

*National Institute of Education, Singapore*

**Roger J. Vallance**

*Divine Word University, Papua New Guinea*

### **Abstract**

A curriculum initiative project was implemented in four schools in Singapore over a span of five to six weeks during 2004. The project employed a number of different schools: girls only, boys only and co-educational schools; different levels of performance in a graded situation; multiple teachers and classes within each site; and control and experimental conditions for the curriculum implementation. The diverse schools offered an opportunity to examine the implications of conducting naturalistic research with some features of action research on a curriculum initiative in multiple sites. Though there were also departures or adaptations made to some characteristics of classical action research, many of the fundamental characteristics of an action research were followed during the project. There was also an opportunity to study the benefits and challenges of conducting multiple site case studies in naturalistic research.

### **Introduction**

A curriculum initiative research project to evaluate the effectiveness of a Literature-Driven English Program in multiple sites was implemented in multiple sites and studied as embedded case studies (Pereira 2006). In each case the same quantitative and qualitative data collection instruments were employed. The research also included some features of action research as well as departures from it. It was felt that the advantages inherent in the included features of action research and multiple case studies of diverse sites would be particularly useful in discovering the merits of the curriculum. Implications of conducting the curriculum initiative project under naturalistic conditions with some features of action research are explored in this paper. In exploring the implications, the advantages of including embedded case

studies as well as the practical and theoretical benefits and challenges of multiple site case studies are also discussed.

## Background

The project involved a curriculum initiative. An integrated English and Literature program was designed and implemented in four Singapore schools. The aim was to discover if the program, named Literature-Driven English Program (LDEP), would be effective in improving writing, reading comprehension and literary analytical skills (see Figure 1 on the next page). The designed curriculum was a goal-oriented program in which the outcome was first identified before combining the different language and literature components into a holistic program.

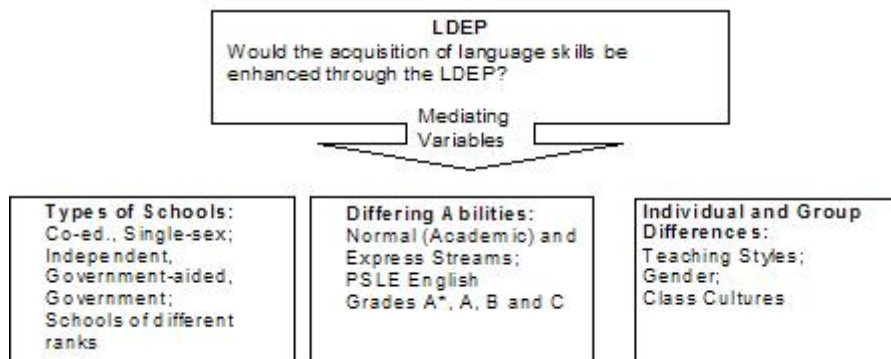
The major research question, contextualised within the Singapore education system and early secondary education, was:

Does an integrated English language and literature curriculum better develop the English Language skills of the students?

The research was undertaken in naturalistic environments in multiple sites or schools. The schools already offered actual classes and the teachers who normally taught these classes volunteered to teach in the program. The proposed curriculum was also implemented without any disruption to the normal working conditions or character of the participating schools and classes. The LDEP was carried out as part of the normal operation in each of the four schools. In doing so, there was scope to study how well the curriculum worked in actual conditions, irrespective of the existence of the many differing variables inherent within and among the different schools (see Figure 1 below).

Since the project included elements of action research through which it was hoped that there would be amelioration in the 'rationality... of... the situations in which the practices are carried out' (Kemmis 1988), it was important to ensure that the pre-existing conditions remained unaltered. Any study conducted in controlled conditions would not lead to an accurate understanding of the effectiveness of the curriculum or the factors that affect the implementation of that curriculum.

Figure 1: Overview of the research on the LDEP



***Participants***

Of the four schools that eventually participated in the research, two were co-educational schools, another was a boys' school and the fourth a girls' school. The lower Secondary One (Year 7) students of these schools, who had just entered secondary education after completing the Primary School Leaving Examinations (PSLE), were selected to participate in the research. These students were selected because they were not sitting for any major examinations at the end of the year. The interests of the participants were safe-guarded and any ill-effects were minimised (NHMRC n.d., NS 4.3). The research involved the implementation of the specially-designed LDEP for five to six weeks in each of the four schools from the period beginning July 2004 to end August 2004. The program was designed to run for such a short duration because schools could only allow a limited period of time for the research to be conducted in their schools. Thus, any inconvenience or detrimental effects that might occur due to the experimentation could be reduced (Dockrell 1990).

One of the aims of the research was to discover the effectiveness of the LDEP by having experimental and control group of students. The experimental group of students were taught under the program whereas the control group of students followed the regular English and Literature Programs. However, one of the schools wanted all of its Secondary One Express and Normal (Academic) classes to participate in the research. Express students and Normal (Academic) students take four and five years respectively to complete their secondary education. On the other hand, the three other schools were willing to have some classes participate as control classes. Table I displays the four schools and information about participant classes and teachers in the schools. There were 17 experimental classes (including one that was excluded from the analysis) and 8 control classes (Table I). Thirteen teachers taught the experimental curriculum (Table I). Thus, not only was this study a naturalistic design using intact functioning classes, the study also included a large number of participants: 964 students from 25 control and experimental classes.

Table I: Participating Schools and Classes and Teachers in each school

Schools	Type	Experimental		Control	
		Classes	Teachers	Classes	Teachers
1	Co-educational	9 <sup>1</sup>	6	0	0 <sup>2</sup>
2	Boys'	3	1	3	1
3	Girls'	3	3	2	2
4	Co-educational	2	3	3	3

<sup>1</sup> Of the 9 classes, one, a Normal (Academic) class, had to be excluded from analysis due to discrepancies in some of the data collected from the class.

<sup>2</sup> There were no control classes in School 1 because the school, in desiring a 'level playing field' for all their students, wanted all their Express and Normal (Academic) classes to participate in the experimental program.

Of the four schools, one school, the boys' school, already had an integrated English and Literature Program. However, there were distinct differences between the Literature-based program of the school and the LDEP. In the Literature-based program of the school limited time was spent on teaching language skills since much of the curriculum time was devoted to literary analysis of the literature text. During the LDEP, however, the explicit teaching of language skills was linked to the study of the literature text.

### **Curriculum initiative project and action research**

The research on the LDEP included some of the characteristics of, as well as departures from, the classical form of action research. There was the desire to improve on existing educational practices (Archer, Holly & Kasten 2001; Kemmis 1988; Thomas 2005) and it was appreciated that the inquiries into the complex situations found in the different schools may not yield unqualified resolutions (Brydon-Miller, Greenwood & Maguire 2003). While action research in education normally concerns teachers conducting research to inform their classroom practice (Mills 2003; Murray & Lawrence 2000; Rosiek & Atkinson 2005), the research on the LDEP was conceptualised by a former practitioner.

In action research, the aim is to work towards amelioration in the 'rationality...[pertaining to] the situations in which the practices are carried out' (Kemmis 1988, p.42). The intent of the current research was to seek an improved understanding of how students learn and gain language skills through comparing the LDEP with existing English and Literature curricular practices within the context of Singapore. Additionally, the aim of the current research, as in any action research, was not to provide all the answers (Brydon-Miller, Greenwood & Maguire 2003). The research was viewed as an initial investigation that would hopefully result in further developments of the LDEP. If the findings from the research lead to a better understanding of the effects of an integrated English and Literature program, the LDEP could be further improved so as to produce beneficial curricular changes in the area of English Language and Literature teaching. Moreover, the presence of many variables was accepted as a necessary component to study the effectiveness of the LDEP and thus, the variables were left intact. Heterogeneity and complexity added to the practical validity of the study since they represented the real-life situations in schools. Thus, knowledge gained from the study is accepted as part of an on-going process of 'drawing theories out of practice, so that theory becomes embodied practice and embodied practice has the potential to emerge again as new theory' (McNiff & Whitehead 2002, p.103).

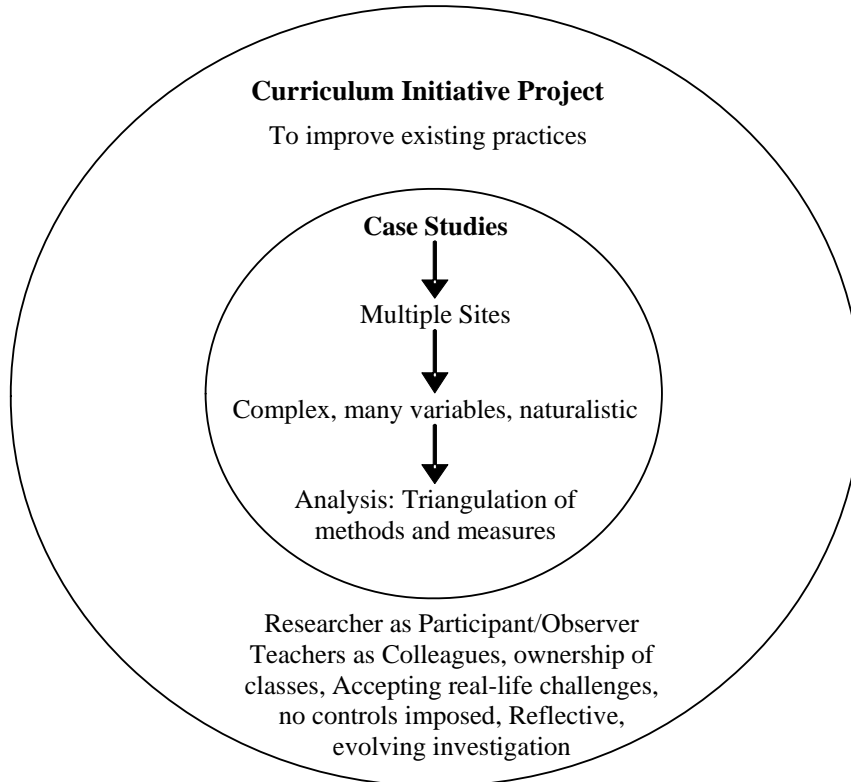
Often, action research in education is conducted by teachers to enhance the practices carried out within their own classrooms (Mills 2003; Murray & Lawrence 2000; Rosiek & Atkinson 2005); however, in the current research a broader view was employed. Though the researcher was neither employed by the schools participating in the research nor directly involved in the teaching of the lessons, she nonetheless played a participatory role. The LDEP, which the researcher designed, was the product of the experiences gained by the researcher as a classroom English and Literature teacher. These classroom experiences like any other classroom experiences of action researchers initiated the research. Brydon-Miller, Greenwood

and Maguire (2003, p.15) believe that ‘action researchers... came to theory largely as a way of justifying what they knew was correct to begin with, to legitimize a politically informed and effective form of knowledge through experience’. Likewise, the chosen research topic was the product of the on-going self-reflection on teaching methods employed by the researcher in the teaching of English and Literature during the course of her five year teaching experience in Singapore. The topic was also inspired by her experiences as a Language Arts teacher in urban and suburban schools in the United States. Like any other action researcher the experiences and experimentation conducted within the classes of the researcher allowed her to discover the benefits of an integrated English and Literature program. She decided to develop and implement a refined integrated program so as to discover its impact on a larger scale involving other schools and teachers. The professional opinion of the teachers was also actively sought during interviews and informal meetings. Consequently, the current research was conducted as ‘an enquiry by the self into the self, undertaken in company with others acting as research participants and critical learning partners’ (McNiff & Whitehead 2002, p.15).

### Implications of conducting research on the LDEP in multiple sites

Figure 2 presents an overview of the curriculum initiative project that was conducted in multiple sites. The main characteristics of the research and the implications of conducting the research as case studies in multiple sites are displayed in Figure 2.

Figure 2: Overview of the research on the LDEP conducted in multiple sites



Implementing a curriculum initiative program is complex in many respects. Whether it succeeds or fails may be attributable to a number of factors. In order to test the inherent merits of the curriculum, as Figure 2 demonstrates, the curriculum initiative project on the LDEP was conducted in multiple sites. Since the intent was to improve on existing English and Literature curricular practices, the complex school environments in the sites were left intact with no controls imposed on the schools (Figure 2). Though lesson plans were given to the teachers, there was no interference with the instructional traits of the teachers or the implementation procedures of the schools. The teachers had full ownership of their classes (Figure 2) and assistance was only offered when requested. Teachers were regarded as fellow practitioners whose professional perceptions of the LDEP articulated during interaction and dialogue proved useful to the researcher during her reflection of the outcome of the research (Bryk, Lee & Holland 1993; McNiff & Whitehead 2002). Additionally, by including the perceptions of the teachers as data the research may prove relevant to them (Mills 2003) and their schools.

It was accepted that there would be challenges and that these were part of the naturalistic environments in which the effectiveness of the LDEP was being investigated. The investigation was also anticipated to be part of an on-going reflective process (Brydon-Miller, Greenwood & Maguire 2003; Schoen & Schoen 2003) that may lead to further development of the LDEP (Figure 2). Consequently, though the intent of the current research was to discover whether the LDEP would be effective in enhancing language skills, it was also accepted that the findings may yield propositions for future improvements to the LDEP.

In investigating the effectiveness of the curriculum in naturalistic environments multiple sites of four schools with many variables were studied as cases (Figure 2). Case studies, and embedded case studies (Yin 1994), of heterogeneous sites could lead to more robust findings (Shofield 2000). The comprehensive exploration of the intact multi-faceted influences acting within and across the multiple site case studies on the curriculum (Stake 2000; Yin 2003) through the use of quantitative and qualitative methods of analysis (Scholz & Tietje 2002) may also lead to a greater appreciation of the utility of the curriculum.

In the next section the implications as well as the advantages and challenges in conducting the curriculum initiative research project in multiple sites which were studied as cases are discussed.

### ***Implications of an embedded case study in multiple sites***

It was believed that multiple site case studies best serve the research objective of assessing the effectiveness of the LDEP since the intent was to test the impact of the LDEP in naturalistic settings with few controls imposed.

A prime reason for conducting the research in multiple sites lay in the nature of the topic of the research. A research that involves a curriculum initiative is complex in many respects. There are many variables that could influence the outcome and as such, it would be very difficult to reach any conclusion regarding the effectiveness of the curriculum. Accordingly, the research was designed to include at least four

schools with very different characteristics and with varying student bodies and cultures to test the experimental curriculum (Figure 1). It was felt that ‘a finding emerging from the study of several very heterogeneous sites would be more robust’ (Shofield 2000, p.80). As such, conclusions reached from the findings derived from the four schools could be more persuasive than if the experimental curriculum was tested on the students of one school.

Conducting the research in multiple sites also allows for multiple analyses. ‘The same case study may involve *more than one unit of analysis* [italicised by Yin]. This occurs when, within a single case, attention also is given to a subunit or subunits’ (Yin 1994, p.41). For instance, in the current research each school became a case study with each class becoming a sub-unit within each school. The conclusions drawn from the findings of each school were studied in relation to the school as well as in comparison to other schools. Thus, what Yin (1994) considers as a possible problem in embedded case study design was avoided. As he expresses it, a major problem with ‘an embedded design... occurs when the case study focuses only on the subunit level and fails to return to the larger unit of analysis’ (Yin 1994, p.44). While the effectiveness of the LDEP was analysed in relation to each mediating variable, in the end, the researcher returned to the main research question of whether the LDEP was effective in imparting language skills in spite of the mediating variables. For instance in one of the co-educational schools, the students from one of the classes registered a negligible improvement effect size of 0.08, while the students from the other six experimental classes improved with moderate to large effect sizes of between 0.35 to 0.88. Observing that the overall improvement effect size registered by all the students in the school was 0.48, it was concluded that in spite of the mediating variable, class culture, generally the students in the school had improved in their writing skills after studying under the experimental curriculum (Pereira 2006).

In addition, mixed methods were used which led to a richer analysis. A case study is ‘a unit of human activity embedded in the real world; which can only be studied or understood in context’ (Gillham 2000, p.1). Mixed methods attempt to develop more trustworthy research by having a variety of data types. Different data types and analyses may result in the strengths of one methodology overcoming or reducing the limitations of another methodology. Similarly, one case (school) has contextual factors that may counter balance the validity of conclusions drawn from the findings of other cases with different characteristics. Mixed methods and multiple case studies are similar in that they each try to use diversity to reinforce validity. In order to have a full contextual understanding of the findings from the four sites or schools, quantitative and qualitative data were collected. The research design employed in three of the four case study schools was:

- 1) an experimental group on which the experimental curriculum was tested, and
- 2) a control group which followed the usual school curriculum.

The quantitative data included pre-test and post-test scores of the writing and reading comprehension skills assessments that the experimental and control groups completed, and the data from surveys completed by the students from the

experimental classes at the completion of the teaching of the experimental curriculum. The purpose in making a comparison between the two groups was to test the effectiveness of the experimental curriculum (Neuman 2003). Qualitative data used to further enhance the analysis of the effectiveness of the experimental LDEP were derived from: pre and post interviews from teachers and post interviews from randomly selected small group of students from each of the experimental classes; field notes and observations during the teaching of the experimental curriculum. Indeed, 'the embedded case design allows for both qualitative and quantitative data and strategies of synthesis or knowledge integration' (Scholz & Tietje 2002, p.14).

### **Benefits and challenges of conducting multiple site case studies**

In order to include as many mediating variables as possible, researching in multiple sites was chosen as the best option for discovering the effectiveness of the LDEP in imparting language skills. There are benefits as well as challenges to conducting research in the multiple sites. The theoretical and practical benefits and challenges of multiple site case studies (Pereira & Vallance 2005) are discussed below.

#### ***Theoretical and practical benefits of multiple site case studies***

From the research it was found that there are at least seven theoretical and practical benefits of multiple case study research. These benefits are explored in greater detail below.

##### ***1. Leading to literal or theoretical replication***

By studying the multiple sites as individual case studies as well as a larger single case study, sub-unit analysis as well as cross-comparisons could be made. According to Yin, 'each case must be carefully selected so that it either (a) predicts similar results (a *literal replication*) or (b) produces contrasting results but for predictable reasons (a *theoretical replication*)' (1994, p.46, italicised by Yin). The diverse cases were included in the study so that if similar measured outcomes were achieved then these outcomes may be considered to be indicative of the effectiveness of the LDEP in enhancing language skills in spite of the many variables. Thus, if there is a literal replication in that the curriculum is found to be effective across the various sub-units, a 'theoretical framework... [which] later becomes the vehicle for generalizing to new cases' (Yin 1994, p.46) could be developed. This theoretical framework would include the curriculum as well as its characteristics that could form the basis for designing the LDEP in other sites or schools.

However, if there are conflicting measurable outcomes, the different variables in the diverse schools may be used to deduce the reasons for these conflicting outcomes. It may be surmised that the curriculum may be effective in some schools or classes but not in others due to some pertinent mediating variables exerting an influence over the outcomes. The assumptions could then generate further research hypotheses and designs to evaluate the theories that arise out of the theoretical replication. Thus, if there is no literal replication, there is a greater possibility of producing a theoretical replication when more sites with varying characteristics are included in the research.



In the research, there were both literal and theoretical replications. With reference to the writing component it was found that in three of the four schools, generally the students improved with moderate effect sizes ranging from 0.48 to 0.56. However, in the fourth school, the students improved with a negligible effect size of 0.18. In comparing the implementation procedures in the four schools, it was found that there were difficulties in the initial stages of the implementation and a lack of understanding of the curriculum principles and objectives. In the fourth school, the teachers had little time to acquaint themselves with the curriculum, resulting in incorrect sequencing of lessons (Pereira 2006). It is possible that these differences in the implementation procedures would have affected the performance of the students in the fourth school.

***2. Testing the curriculum in a naturalistic environment with diverse variables using mixed methods***

Schools vary, students differ and so do classes. It would be difficult to reach any conclusion about a curriculum that is tested on a single school. There could be many plausible reasons for a curriculum succeeding in one school and just as many possible reasons for failing in another. Therefore, depending on a single research site or school would make the findings applicable only to that school and perhaps to schools with very similar characteristics. However, by conducting the research in multiple sites with very different characteristics in the current research the LDEP was tested in situations that included more variables, thereby emulating a wider naturalistic educational setting.

A curriculum that is effective in more schools with more classes would have more practical benefits than one that is found to be effective in only one school or a few classes. Mixed methods were also utilised to analyse the data since the use of ‘both qualitative and quantitative methodological tools’ would allow for ‘both the subjective and objective points of view’ to be included (Tashakkori & Teddlie 1998, p.26). The combined use of quantitative and qualitative data led to ‘the multiple sources of evidence [which] essentially provided multiple measures of the same phenomenon’ (Yin 1994, p.92). The diversity of variables from which data were collected and the use of mixed methods to analyse the data would also aid in authenticating the conclusions drawn from them (Guba 1981). The diversity in variables and methods would therefore lead to a greater understanding of the effectiveness of the curriculum.

The findings from the research indicate that the curriculum may have been effective since only two of the experimental classes registered negligible positive effect sizes while the positive effect sizes of the improvement displayed by students from the other 12 classes ranged from a respectable 0.29 to a large 0.88. The qualitative data and the quantitative data from the surveys completed by the students from the experimental classes also indicate improved writing skills (Pereira 2006). The qualitative data substantiated the findings of the quantitative data.

### ***3. Leading to greater coverage or sample of potential variables***

In the research on the LDEP, there were many variables: ability; gender; school and class cultures; and teaching styles. These variables existed within as well as across the schools studied. None of the variables were experimentally controlled and so the variability was similar to that normally encountered in the schools. Moreover, some of the variables such as the different teachers and the various protocols practised in the diverse schools appeared only during the implementation. Since the type of research was naturalistic, these variables were necessary components of the research and the many variables led to larger sample of variables being included in the research. Additionally, in line with the nature of the curriculum initiative research in retaining the naturalistic environments of the schools, no attempt was made to apply a measure or metric of differences in class or school culture, and teaching style. The same measures, the Primary School Leaving Examinations (PSLE) overall and English subject grades, which the schools use to sort student ability levels before the students enter Secondary One, were used as an indicator of general and English Language abilities in the same way that the schools make use of these data.

### ***4. Possibility of more robust findings in heterogeneous multiple cases***

The LDEP that was tested in the four schools was the only constant amidst many variables. In the research on the LDEP, the schools, the thirteen teachers and the students in the seventeen experimental classes reflect a diversity of abilities, skills, teaching or learning preferences, motivation levels as well as school and class cultures. By testing the curriculum in these different situations, without manipulating or controlling any of the variables, any finding in relation to the effectiveness of the curriculum would be more dependable. Since the quantitative and qualitative findings indicated a general improvement in student performances across most of the schools and individual classes, it was possible to draw the conclusion that the inherent merits in the LDEP were the most likely reasons for the improvement.

### ***5. Naturalistic Generalisation***

A conclusion formed from an analysis of similar findings collected from the multiple site case studies consisting of the four schools may lead to a '*naturalistic generalization* [italicised by Stake], derived by recognizing the similarities of objects and issues in and out of context and by sensing the natural co-variation of happenings. To generalize this way is to be both intuitive and empirical' (Stake 2000, p.22). It may be argued that since the LDEP was found to be effective in different kinds of schools consisting of a diverse student population and teachers with varying teaching styles the conclusions about the LDEP drawn from the outcomes may be applied to more schools with similar variables and contexts.

Generalisation of findings collected from samples of diverse population in multiple case studies pertains to contextual generalisability and not empirical or positivist generalisability. It is up to the reader to judge if the findings of the research can be generalised in the event that the contexts of any of the research sites are found to be similar to the context of the reader (Lincoln & Guba 1985). Indeed, 'accepting generalizations (to whatever extent they may be possible) as indeterminate, relative

and time- and context-bound, while not a wholly satisfying solution, is at least a feasible one' (Lincoln & Guba 2000).

Since generally there were improvements in most of the schools and classes regardless of gender and diversities in schools, classes and in the abilities of the students, the curriculum appears to have inherent merits that warrant further investigation on a wider scale. The curriculum could be tested in more schools so as to benefit a wider school population.

### ***6. Possible wider potential interest***

The naturalistic generalization could result in a wider potential interest and audience. Other schools in Singapore, and perhaps in other countries as well, have a wider choice from the four very different multiple case studies included in the research with which to compare their schools.

### ***7. A large amount of data***

Multiple site case studies also present the researcher with a large amount of data. There are two advantages to having a large amount of data. The first advantage is that should there be a problem with a particular type of data, there are other sources on which the researcher can rely. For instance, when the findings from one of the schools did not replicate those from the other three schools, the qualitative data from the observations and the interviews with teachers and students indicated that the reason might lie with the differences in the implementation procedures and in the teachers having an incomplete understanding of the curriculum (Pereira 2006).

The second benefit is that the rich sources of data permit the creation of a theoretical framework if there is literal replication or in cases where there are divergent outcomes there is an increased possibility of explaining the differences in outcomes. With regard to the research findings, it was possible to hypothesise that while the curriculum appears to have merits, an improper implementation, lack of proper sequencing of lessons and inadequate understanding of the curriculum principles could adversely affect the effectiveness of the curriculum (Pereira 2006).

The research into a curriculum initiative that is studied in multiple site cases provides a number of theoretical and practical advantages which also argue for the validity and reliability of the research findings and conclusions drawn from them.

### ***Theoretical and practical challenges of multiple site case studies***

Multiple site case studies may present many advantages, but they also come with challenges. The challenges faced by the research during the course of multiple site case studies include:

- 1) Deciding on the meaningfulness of the many variables and reconciling the conflicts in the pertinent variables was one of the challenges. A variable on its own is of no importance unless it has the potential to influence the finding. Initially, outcomes of the performances of the individual control classes in the writing assessment were examined. However, such a comparison was found to be unnecessary and irrelevant since the control group did not register any improvement. Additionally, within a

variable there may be differences. For instance, the findings revealed that there were differences in the performances of the girls from the girls' school and co-educational schools. The girls in the co-educational schools performed well, registering moderate improvement effect sizes whereas the girls from the girls' school displayed negligible improvement (Pereira 2006). It then became important to form a sub-group within the variable, gender, and to ascertain the cause of the difference.

2) The second challenge lay in deciding how the discrepancy in outcomes between schools or classes could be explained. Since there were many variables, it would be difficult to decide on which variable or variables may have influenced the difference in the outcomes. For example, Schools 1, 2 and 4 registered similar improvements but the improvement achieved by the students in School 3 was significantly lower. Since the three other schools would also have many mediating variables, it was necessary to discover the difference in the variables in School 3 that would have had an impact on the overall performance of the students in School 3.

3) The third challenge rested on the premise that if there were discrepancies to which answers could not be easily sought, there could be no replication. Then, the results would be pertinent only to the individual cases and would have no significance for any other schools. Fortunately, in the research on the LDEP, there were more similarities than discrepancies and an attempt could be made to explain whenever discrepancies did crop up. Within classes with discrepancies there were similarities and there were differences between these classes and other classes with no discrepancies. The two experimental classes that registered negligible effect sizes belonged to different schools and yet, there were similarities in that many of the students from these classes came from a Chinese-speaking home background. The teachers who taught these classes reported that the students were generally less motivated during English classes than the students from the other classes (Pereira 2006).

4) The final challenge lay in the limited time and resources available for the conduct of this research project and in the large amount of quantitative and qualitative data. There was only one researcher working alone in schools that could afford only a limited time of a few weeks to complete the program. The large amount of quantitative and qualitative data also meant a lot of time and energy were needed to analyse them.

## **Conclusion**

Conducting a naturalistic research with elements of action research in multiple sites offered a number of advantages and challenges in assessing the effectiveness of a curriculum initiative in advancing the language skills of students. Though there were challenges arising from the diverse variables found in multiple sites, the benefits made the research worthwhile. Additionally the use of mixed methods allowed the researcher to substantiate the findings from the quantitative data with those from the qualitative data and to explore for possible explanations when there were differences in the findings from the various datasets.

The large amount of rich data collected from testing the curriculum in the research sites with pre-existing diverse variables increased the likelihood of generating literal or theoretical replication which could lead to a naturalistic generalisation. The literal and theoretical replications also enabled the researcher to hypothesise that while the curriculum appears to have inherent merits, it is also necessary to ensure that the curriculum is well implemented and that the teachers are well-equipped with the

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knowledge and expertise to teach the curriculum. Inadequate understanding or a lack of support in the implementation can adversely affect the effectiveness of the curriculum.

Conducting a naturalistic research in diverse multiple sites for the research produced many advantages. The encouraging positive findings from the curriculum initiative project merit a greater exploration of the curriculum especially since the research was conducted in naturalistic, diverse environments and the data were analysed through mixed methods.

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