Chapter 4

Results: presentation and discussion

4.1 Introduction

The CALIS Project began long before it began and might not have ended at all when it ended. Such is the systemically complex interrelatedness of a computers-in-education project with the synchronic, diachronic and metaphoric dimensionalities of the context within which it is situated. It is virtually impossible to isolate individual reasons for the continued use of computers in schools, after government support had been withdrawn, from the contextual network within which they are integrated.

Bearing in mind this interconnectedness, it was apparent from the beginning that Mooij and Smeets’ (2001) framework for the successful integration of computers in schools would form a useful point of departure in examining the influences supporting the implementation of computers in schools with a view to ensuring sustainability. This framework accentuates the role played by active participants from the macro- or international level, through the national, regional, district, institutional, and educator levels to the micro-level of thought processes experienced by the learner. The framework presents synchronic interrelatedness fairly effectively but is silent on the diachronic situatedness of a particular state of affairs. Furthermore, complexity of the systemic kind related to educational systems, as intimated by Fullan (1999, 20012001, 2005), needs to be accounted for.

Diachronically, educators and project managers brought certain historically defined character traits and experiences to the project. The institutions at which the Project was implemented were historically-situated in terms of their philosophical, structural and financial make-up. The interrelationship between the department of education and the district, and region, in which the Project was implemented, was characterised by a strong Christian National ethos which found expression in the image of the pioneer farmer who had escaped the tyranny of the British occupation of the Cape Colony and who had been entrusted with a sacred mission as one of God’s chosen few. This must be seen against the national backdrop of a country at odds with itself and in the midst of radical social and political change. The international situation with regard to computers was equally
significant at the time, since the decade heralded not only a massive growth in the sales of personal computers worldwide, but also the emergence of the Internet as public domain.

It is clear that any framework aimed at indicating systemic complexity as a one-dimensional, synchronic explanation is destined to failure since it ignores the two-dimensional complexity that inhabits a synchronic /diachronic plane. But the full, three-, or four-, or five-dimensional picture is more complex yet. The synchronous/diachronic matrix cannot capture the full complexity of a living project that develops in autonomous and often unexpected trajectories, much like the strange attractors that characterise chaos theory. But what can, and does, capture such complexity is the use of metaphor that is able to activate a wide range of often indeterminate weak implicatures. Such implicatures operate in both standardised and highly individualised ways.

For this reason, the structure of this chapter will mimic the evolutionary process of increasing complexity. Initially, the participants who experienced and who interpret the project will be introduced. Thereafter, the synchronous interrelatedness of macro- and micro-level complexity, both within and surrounding the Project will be discussed. This will be accomplished by focusing on personal, physical, programmatic and systemic interrelatedness. Finally, the inadequacy of these dimensions as fully determinate will be demonstrated in the light of the multi-dimensionality of metaphoric interconnectedness.

This systemic interconnectedness will be examined by means of a Relevance Theory approach to the analysis of metaphoric patterning in the narratives presented by participants. In this regard, the initial impressions made by the various participants may provide valuable insights into their own synchronous and diachronic situatedness within specific contextual frameworks. Such insights are useful in shedding further light on their actions, motivations and world views.

4.2 The participants

Dr Peet Venter is an urbane, distinguished-looking gentleman who exudes confidence and who possesses an imposing presence, even though he is not physically imposing. He lives in an affluent suburb of Bloemfontein and is officially retired. He was appointed Director of the Computer Section of the pre-1994 Orange Free State Education Department (OFSED) in 1991 and stayed on until the end of 1995. First impressions, as recorded in a reflective journal after the meeting with him on 14 July 2004, indicate that he is clearly “a

planner and a thinker and [that he] still has a finger on the pulse of technology in education”. This impression is supported by the fact that he is presently involved in a consultative role with Sacred Heart College, an NGO that facilitates the implementation of the Intel Teach to the Future programme in secondary schools in the Free State region. He is also involved in delivering ICDL (International Computer Driving Licence) training to officials of the present OFSED. He seems to be critical of the motives of some of the officials appointed in the post-1994 OFSED. He is also adamant that the officials responsible for ending the CALIS Project were short-sighted and did not appreciate the full potential of the Project to alleviate the digital divide that had already been entrenched in the pre-1994 era.

If Dr Venter is seen as the visionary strategist who engineered the design logic of the CALIS Project, then Hercules Dreyer must be seen as the tireless weaver of miracles for whom no challenge seemed in any way insurmountable. On meeting him in the plush boardroom of a successful software merchandising company in Pretoria, it was immediately clear that he possesses certain specific qualities relevant to the CALIS Project:

Hercules is a very intense person and very passionate about integrating ICT into the curriculum. He is clearly a self-starter and someone who is committed to excellence. Also, Hercules is willing to go the extra mile. He is intelligent and articulate and seems to be a born educator. Hercules seems slightly disenchanted with his present job (software sales) and longs to get back into teaching. He is very interested in the research and very willing to help in whichever way he can. (Research Journal, 9 July 2004).

Although his diminutive physical stature contrasts strongly with his namesake of classical antiquity, it is also clear that he shares many qualities with the Ancient Greek demi-god in terms of tireless effort and steely determination. Hercules was a teacher at a secondary school in Bloemfontein and acted as school administrator of the FRESAD programme. In this capacity, he got to know Johan Badenhorst, who was the person responsible for the administration of the FRESAD programme at the OFSED. The perception at the time was that capacity building in this role was required and Hercules was appointed as Johan’s assistant. Later, after the appointment of Dr Venter, in 1991, Hercules became intimately involved in the CALIS Project and eventually managed the entire project whilst Dr Venter was involved in the FRETEL and FRENET initiatives. Hercules was offered a
post in the private sector shortly before the final withdrawal of government support in 1996, and he subsequently moved to Pretoria.

Johan Badenorst, who was originally the administrator of the FRESAD programme in the OFSED, was already in the employ of the Department before the arrival of Dr Venter. As such, he is able to bear witness to initiatives relating to the use of computers in secondary schools dating from 1986. As explained below, such initiatives focused largely on the dual purposes of enhancing computer literacy amongst school teachers and embedding administrative applications in schools as a pre-cursor to full integration of computers into the curriculum. Johan is currently the Director of the Centre for e-Learning and Educational Technology at the Central University of Technology, Free State. Our meeting took place in his office at the Centre on 22 February 2005. Johan bears a startling physical resemblance to Hercules Dreyer. He is not physically imposing and is also soft-spoken, but the intelligent eyes mirror forth a thinly-veiled passion for the role of computers in education (Reflective Journal, 22 February 2005). Johan is a doer and someone who is not in the habit of tolerating unfinished business. He stayed on at the OFSED longer than anyone else involved in the Project and was finally appointed at the Central University of Technology, Free State in 2001. His frustration at the lack of closure relating to the CALIS Project, precipitated by the abrupt withdrawal of government support, is evident in the unfolding of his narrative.

Whereas the previous three participants were involved in the management of the Project at the OFSED, the following four participants were teachers who were actively involved in the implementation of the Project in the classroom. Of these four participants, three eventually became involved in the management of the Project, either directly or tangentially.

Possibly the most colourful of the four, Maureen Dale is currently the Headmistress of Eunice Primary School in Bloemfontein. She was appointed Headmistress of the school shortly before the Project was implemented at Eunice Primary School. She was approached by Johan Badenhorst and Dr Peet Venter to organise and present two of the annual expos at Eunice. She was thus actively involved in the integration of computers into the curriculum but also became tangentially involved in the management of the Project when she agreed to organize and host two of the annual expos. I met Maureen on 14 February 2005 in the Headmistress’s office at the school. Eunice Primary is one of the most prestigious schools in the city and has a long and distinguished history. The luxurious wood panelling in the spacious office occupied by the headmistress
and the ample furnishings bear testimony to the school’s relatively affluent status. Maureen immediately strikes one as someone who is confident in her ability to manage and control (Reflective Journal, 14 February 2004). She is petite and physically unassuming but her mellifluous voice has a strength and depth that suggest authority. She appears to be very confident of the veracity of her beliefs and exudes determination and a sense of purpose. What is also patently evident in her narrative is her own passion for computers in education.

Maureen’s involvement in the management of the Project, though crucial to the continued existence of the Project, was at best structurally tangential. In contrast, Igno van Niekerk and Sarie du Plessis were initially involved as teachers who became involved in the active integration of computers into classroom practice, but who ended up being drafted into the management structure of the OFSED management team.

Igno van Niekerk is currently employed in the Training Division of Liberty Life and is involved in corporate computer-based training. Interestingly, he works in the same Division as Louis du Plessis, Sarie’s husband. His involvement with the CALIS Project began when he was employed as an English teacher at Voortrekker High School in Bethlehem. Hercules Dreyer visited the school in order to introduce the CALIS Project, and, in the process, Igno decided to become involved. Subsequently, he was awarded first prize for the best computer-integrated module at the first annual expo and was given the opportunity of attending the international WCCE (World Conference on Computers in Education) in Birmingham in 1996. On his return he was appointed by the OFSED to manage the FRETEL Project (a CALIS – related Project, as discussed below), after Hercules Dreyer had resigned from the Department.

I first met Igno in what can best be described as an interview cubicle in the offices of Liberty Life in Bloemfontein. The feel of the interview is best captured in the words used in the Research Journal entry, dated 19 May 2005:

The interview takes place in a generic customer service room with a round table and basic chairs – nothing on the wall but a piece of plastic piping on the table – austere – one of those ‘don’t-waste-my-time rooms – I have exactly five minutes for you. Yet his smile is warm and genuine. He is obviously more than willing to tell his story – how long has he been waiting for someone to listen to his story? There is almost a need to tell – to justify – boasting about achievement.
Igno, though diplomatic and cautious, gives the impression of someone who embodies the dictum: ‘the truth will out’. He seems determined to make known the positive effect of the Project, not only on his own life, but also on the wider community: regional, national and even international. He is also at pains to point out what the Project might have achieved if it had been embraced by the post-1994 OFSED.

Sarie du Plessis, in contrast, is currently employed by the OFSED and works in a monolithic structure known as the C.R. Swart Building. At the time of the implementation of the Project, Sarie and her husband, Louis, were teachers at the Primary and High Schools in Clocolan, respectively. After having been involved in the CALIS Project for a year, they decided to relocate to Bloemfontein and Sarie was subsequently appointed by the OFSED to assist Igno in the management and operational functioning of the FRETEL Project.

I met Sarie on 19 May 2005 in her office, overlooking the skyline of Bloemfontein. The following transcript from the Research Journal entry, dated 19 May 2005, best captures the nature of that meeting:

She smiles the whole time. She is unwilling to commit herself to an opinion on the withdrawal of government support in 1994 because she is in the belly of the beast. The interview takes place on the twelfth floor of the C.R. Swart building, which houses the Orange Free State Education Department. The smile is playful and deceptive. She will not be drawn into committing occupational suicide but she very badly wants to tell me that she despises their decision. She is presently involved in setting up the same structures and the same system ten years later and is unable to comment – I get the idea that the smile signifies that there is no need to comment: the disjunction, the passage of ten years and the implied silence of this passage shout louder than she could – this is what the smile says.

Ronel Calitz is the only participant who was not appointed by the OFSED, as a member of Dr Venter’s team, subsequent to her implementation of the CALIS Project in the classroom. She is currently employed by the OFSED as a coordinator of Learning Facilitators in the General Education and Training Phase (G.E.T) and is stationed in Sasolburg. Ronel is also the only participant who is not presently directly and actively involved in some kind of computer-integrated education. She is, however, indirectly involved through the Roos Reading
Programme for Foundation Phase learners. This programme had been developed before the implementation of the CALIS Project and might well still be in use in some of the schools in the Free State Region.

Ronel is an intelligent, imposing person who seems to be strong-willed and determined. She is also slightly disenchanted with the context in which she presently finds herself:

Ronel works for the Department of Education in Sasolburg. The building is situated in a suburb and is clearly a converted school. Her office, though spacious, is situated on the top floor at the end of the left wing of the building – symbolic of her own perception of her marginalisation: she studied the M.Ed. in Computer-integrated Education at the University of Pretoria but is presently employed in an administrative function. She feels bitter that the people presently engaged in strategising the implementation of e-learning in the Free State seem not to have the requisite training or skills. She feels that she might have been consulted on these issues, rather than having been employed in a purely administrative role. The fields outside the ex-school building are withered and worn and add to the feeling of dilapidation and despondency (Research Journal, 31 March 2005).

4.3 Synchronic, diachronic and metaphoric systemic structure

As indicated in Chapter 3, after an initial analysis of the narrative data, it appeared that the systemic interconnectedness hinted at in Mooij and Smeets (2001) at various levels of structural complexity might be a good starting point in terms of further analysis. The structural levels thus identified were broadly classified as follows:

a) international;
b) national;
c) regional;
d) project;
e) district;
f) institution;
g) educator; and
h) learner.

It also appeared, however, that the identification of interventions at various levels of structuration was too simplistic to capture the complexity of the networked nature of the sustainability of computers in schools. The interventions at various systemic structural levels would have to be supplemented by a second dimension that cut across all structural levels. Such a dimension was found to address the following broad categories of determining influences:

a) personal;
b) physical;
c) programmatic; and
d) Systemic.

The personal category relates specifically to those personal traits and characteristics possessed by various people at various structural levels of the system, and more specifically, the traits and characteristics affecting the Project directly. The physical category describes the availability of physical resources such as buildings, classrooms, audio-visual equipment, computer hardware, computer peripherals, computer software and other physical resources. The programmatic category attempts to address those systemic and structural attributes that were specifically engineered by the creators and managers of the Project in order to fulfil specific purposes. In contrast, the systemic category attempts to address those systemic and structural aspects of structural levels that were not specifically engineered by the creators and managers of such levels with the express purpose of achieving preconceived goals and objectives.

Further analysis of the data reveals, however, that the two-dimensionality of the approach adopted above, though an improvement on the initial approach, suffers from two important shortcomings. The first, as discussed below, is the difficulty, if not the impossibility, of isolating specific categories and separating off these influences in a contrived and forced manner from the influences dynamically connected to them.

The second, related, shortcoming is that the dissection of influences outlined above, almost by implication, precludes insight into the dynamic, fluid and interrelated functioning of the system as a whole. A Relevance Theory (Sperber and Wilson, 1986, 1995; Pilkington, 2000) perspective on the interpretation of metaphor provides revealing insights into such functionality. It does so because interpretation of metaphor under Relevance Theory is geared
towards the activation of a wide range of strongly and weakly held implicatures and assumptions about the world. Such implicatures and assumptions are partly implicated by the speaker but are also partly supplied by the hearer who must choose a context, or contexts, within which these implicatures are to be interpreted. The emergent picture is thus a complex compound of dynamically interrelated implicatures and assumptions that give life to the full gamut of influences that interact on, and across, various structural levels of the system - and that dynamically link personal, physical, programmatic and systemic influences.

The ensuing discussion, analysis and interpretation of the data will thus examine each of the identified categories, namely personal, physical, programmatic and systemic in terms of the structural systemic levels initially identified namely international, national, and regional, project, district, institution, educator and learner. Finally, the metaphorical patterning woven into the participant narratives will be examined in terms of its systemically animating functionality.

**4.3.1 Personal influences**

The role played by individual actors at different systemic structural levels in bringing about the integration of computers into classroom practice is outlined clearly by Mooij and Smeets (2001). What is not immediately clear, however, is whether character traits required at the different structural levels are generic or whether very specific character traits are required at different structural levels. Furthermore, it is not certain whether such character traits associated with integration are necessarily the same character traits associated with the sustained use of computers in schools. Finally, how is the diachronic influence of character traits in the integration phase separated off from the influence of character traits on the sustained use of computers? Or, put more simply, how can we be sure that character traits influencing integration do not also influence sustainability?

An initial analysis of character traits at the various structural levels addresses only part of the answer. The situation of these character traits within interconnected, dynamic metaphorical networks provides the complexity needed to address the issue in its entirety.

**4.3.1.1 International**

Although it is very difficult to find evidence at the international structural level of personal attributes that influenced the sustainable use of computers in schools, after the withdrawal of government support of the Project, it is conceivable that such personality traits and
characteristics might well have motivated international corporations to become involved in the propagation of educational computing in South Africa. No specific reference is made, however, in any of the participant narratives to such personal traits and the matter can thus not be discussed in any further detail.

4.3.1.2 National

Although specific people in the National Department of Education might be suspected of having had a significant systemic influence on promoting the sustained use of computers in schools in the Free State region, the most significant influence at national level came from an academic programme associated with the Faculty of Education at the University of Pretoria.

Reference is made in the narratives to the significant role played by the existence of the M.Ed. in Computer-integrated Education (C.I.E.) programme at the University of Pretoria. Dr Venter relates how the enquiries he made convinced him that the programme offered at the University of Pretoria was superior to any similar programmes offered at other South African institutions.

What is particularly evident in a number of the narratives is the personal attributes associated with Professor Johannes Cronje who, during the course of the CALIS Project, was both a student presenter and later coordinator of the programme. In the ensuing passage, Dr Venter comments on the establishment of the working relationship between OFSED, represented primarily by himself, and the unit offering the M.Ed. in C.I.E. (the numeral next to the translated quotation corresponds to the same numeral next to the original Afrikaans quotation in Appendix):

(1) So we drove up [to Pretoria] one day and saw them, and asked them whether they would want to enter into some kind of partnership with us – with our little team in the Free State. They could advise us and conduct research here; they could use their students to do the work here and, in this way, we could gain knowledge from them. They were anxious to help, and kind and we formed a wonderful group (Peet Venter).
Particularly noteworthy is Dr Venter’s perception of the attitude of the people in Pretoria as being ‘pleasant and eager to help’. Although no mention is made here of specific people, it is clear that the attitude of the Pretoria contingent was instrumental in contributing to the establishment of the working relationship between the two groups.

The identification of character traits relating to Professor Cronje, specifically, is evident in a number of narratives. The references are made, particularly, in the context of annual expos, where Prof Cronje’s presentations were experienced as being animated and inspirational:

(2) And at the very first one [expo] that I attended, Professor Cronje was one of the students who accompanied their lecturer; they arrived and he [Professor Cronje] delivered an outstanding presentation with a great deal of gusto – an inspiring kind of performance (Igno van Niekerk).

(3) Well, interesting, I think, if one reflects – and this is not because the study is being done for him – but Johannes Cronje’s enthusiasm at the very first CALIS expo drew much attention….That enthusiasm, that eagerness, that interest is one of the things I remember (Igno van Niekerk).

The most wonderful guest speaker was Johan - and for the life of me I cannot remember what his surname as….

JOHANNES CRONJE

That’s it.

HE’S MY SUPERVISOR.

Is that so? He was a great guy – absolutely splendid and also brought to me and introduced to me by Johan Badenhorst, but you couldn’t wish for a better chap – you’re lucky, you are very lucky. I mean he can keep an audience enwrapped like no- one can (Maureen Dale).

The suggestions here are to be interpreted within the context of the expos where teachers were made aware, most of them for the first time that computers could be employed in the classroom as an integral part of classroom practice. The personal qualities of Professor Cronje highlighted in these extracts are ‘enthusiasm’ and ‘inspiration’. The context in which these suggestions produce the most rewarding contextual effects for the least processing effort.
relate to assumptions regarding the position of teachers who experienced Professor Cronje’s presentations as an introduction to the concept of integrating computers into the curriculum.

At the time, the school curriculum was rigid, content-driven and geared towards instructionist practice. There were, however, initiatives afoot designed to break this mould. The launching of the Project happened to coincide with the introduction of the problem-centred approach in Mathematics and more social constructivist interaction in the languages, as documented below. The assumptive contextual framework of the teachers hearing Professor Cronje’s address are thus likely to have included assumptions relating to ‘new-fangled approaches’ and the difficulty of implementing these approaches given workload and time constraints. Professor Cronje’s enthusiasm would have captured the attention of these teachers and what would have been truly inspiring would have been the twin realization that the computer could be integrated into classroom practice, but also the fact that such integration could present the teacher with a valuable ally and tool in adopting a radically different approach to teaching and learning (as indicated by Igno van Niekerk below).

**4.3.1.3 Regional**

Although specific people in the National Department of Education are not seen as having influenced the Project in any meaningful way, the opposite can be said for the regional OFSED. At the time of Dr Venter’s appointment, Dr Gert Heyns was the Director General of Education in the Free State. Mr Heyns is described by Dr Venter as being a very competent strategist, financial manager, and, more importantly, someone who envisioned a critical role for computers in education in the region:

> (4) So, his vision for computers in education helped a lot – his attitude and his unbelievable financial management skills – he was unbelievable. He would come across a few things and would draw our attention to them: ‘Why did you make the decisions you did? Why did you not do the following?’ Then we would answer that we had made the following decision. Then he would say: ‘no, you can look in the following files and you will see that our decision was different’ He was very particular about things like that. But that ability of his helped us to do a number of things very quickly (Peet Venter).
Mr Heyns’s vision for the role that computers could play in primary and secondary education, coupled with his managerial skills and financial management clearly played a major part in establishing the kind of protective institutional mandate required to provide a secure environment for the fledgling Project. The context in which the comments above are to be interpreted is influenced strongly by assumptions derived from a comment made by Dr Venter, which is analysed in more detail in a later section of this report. According to Dr Venter and Hercules Dreyer, Mr Heyns would, at the end of each financial year, determine how much budgeted money had not been spent in various sub-departments within the OFSED. Such monies would then be assigned to Dr Venter’s Project for the express purpose of supplying schools with computer hardware and software. The result was that infrastructural development of the Project proceeded fairly rapidly during the short period characterized by Departmental support. The result was that, when Departmental support was withdrawn, the hardware and software infrastructure in schools was virtually in place. In this sense, the personal characteristics of Mr Heyns seem to have played a pivotal role in furthering the aim of implementing the Project for sustainability.

In terms of the categories in use in this study, the artificial disjunction between personal qualities and physical resources finds visible expression in the case of Mr Heyns’s involvement. His intellect, attitudes and values, which are classified here as personal attributes, were directly responsible for his actions in providing the physical resources that fed the establishment of the hardware and software infrastructure. The infrastructure thus created provided a solid foundation for the continued use of computers in the classroom. This kind of dynamic causality that characterises a complex system cannot be explicated in terms of the two-dimensional synchronic and diachronic view presented here. It will, however, be addressed in ensuing sections relating to the use of metaphor in the various narratives.

4.3.1.4 Project

In terms of the Departmental team that implemented the CALIS Project, it is clear that character traits played a major role in ensuring the sustainability of the Project. It is noteworthy that both Dr Peet Venter and Hercules Dreyer possess exactly those qualities that were crucially relevant to the respective roles that they played in the Project.
Dr Peet Venter
The single most commonly encountered quality with reference to Dr Venter in the narratives produced by the other participants is that of ‘visionary’:

(5) The knowledge, the information that they had – the vision that those guys had been unbelievable – it changed my approach in the classroom completely (Igno van Niekerk).

(6) Dr Peet Venter was a guy with an unbelievable vision - ..... (Igno van Niekerk).

(7) I think the vision that he had at the time was simply fantastic (Igno van Niekerk).

(8) When I think about it, I think that Dr Venter made one aware of horizons which one never thought existed – definitely. You were never aware of it, but, through your involvement with CALIS, you became aware and you became involved (Sarie du Plessis).

Although the exact nature of the vision that he possessed is not enlarged upon in these excerpts, it is apparent that teachers who observed this quality first-hand were enthused and found his approach to the role of computers in the classroom inspiring:

(9) Ok, the first thing was the fact that Dr Venter and his team inspired one (Sarie du Plessis).

Dr Venter himself provides the most compelling evidence of the nature of the ‘vision’ that he possessed with regard to the Project. In the first instance, there is evidence to suggest that Dr Venter conducted extensive research into the integration of computers into classroom practice in other countries:

(10) He wants us to begin considering the use of computers in the classroom. The computer is not used as a resource in the classroom. He had conducted extensive research
overseas and had come to the conclusion that it [the computer] could be a wonderful resource (Hercules Dreyer).

Secondly, his understanding of the socio-political situation in the country, and the way in which it would subsequently develop, coupled with his understanding of the way in which technology, and computers in particular, could be employed in leveraging educational change, enabled him to identify the impending political change as a significant opportunity to contribute towards the enrichment of educational environments both in affluent and in previously disadvantaged societies, throughout the system:

(11) I thought at the time – and it doesn’t take a rocket scientist to know this – that, where we had 180 schools, we would suddenly have 1800 or 2000 schools in the new dispensation in the Free State. We have problems communicating with fewer than 200 schools – slightly - how will it work with 1800 schools? The schools will be situated in outlying, inaccessible areas. Here is something we can pilot and see whether it works (Peet Venter).

Based on the premise that there would be one, unified department of education after the elections in 1994, Dr Venter needed a way in which he could ensure that effective channels of communication were established between the Department of Education and all schools at various levels, not only in terms of management, but also in terms of communication between learning facilitator and subject teacher. Dr Venter’s reaction to Absa’s offer of satellite television broadcasts is telling:

(13) And not one of the other provinces was interested in it but we were anxious to use it because I personally felt, at the time, that the ideal communication channel was that between the Department and the school: from the LF’s [learning facilitators] to the teacher (your big challenge) and thus effective dissemination of knowledge, management training and curricular knowledge could be accomplished (Peet Venter).
But Dr Venter’s vision was not merely vision in the abstract. His vision was accompanied by his ability to plan strategically:

(14) He and I drove to schools in the car – I used to have a little recorder just like that one – then I remind myself: ‘Remember to do that’ – we wrote things down – we were always planning – those plans have to be made – you need guys like Peet Venter – the teachers have to be motivated consistently –... (Hercules Dreyer).

The plan that emerged was one that recognised the importance of ensuring the acquisition of basic computer skills as a prerequisite for the acquisition of skills necessary for the integration of the computer into the curriculum, but in such a way that the acquisition of these skills would not be invasive or demotivating. The idea was that teachers were to acquire basic computer skills with the express purpose of using these skills in creating computer-based lessons:

(15) But I do believe – perhaps slightly old-fashioned – together with e-learning and Intel – I still believe – that it is much easier to use Intel [Intel Teach to the Future Programme] and things like that if you have basic word processing, Excel, PowerPoint and similar Internet tools. I think the truth lies somewhere between the two: you have to acquire some basic skills but these should not be unconnected – there has to be a purpose, a goal that will be reached by using these skills (Peet Venter).

The overarching systemic plan found expression in action plans that incorporated the introduction of learner-centred constructivist, and to a large extent constructionist, learning. This focus supported and enriched the problem-centred approach to Mathematics and the social constructivist approach to the languages, introduced at virtually the same time as the CALIS Project.

(16) And you can use one group by saying to them: ‘You will be working on the computers today’; and to another group you say: ‘you will continue with work in your desks’; and to a third group you say: ‘I want you to work in close proximity
to the teacher’. This was aimed particularly at the primary school. So he saw that there was a need for the use of computers in this way (Hercules Dreyer).

So, Dr Venter’s vision for the integration of computers into classroom practice found expression in innovative action plans relating to classroom implementation. But the innovative and inspirational quality of his leadership did not end there. He was situated, at the time, in an education system strongly aligned to the philosophy of strict hierarchical and vertical functionality – the educational equivalent of a command economy. In this context, his leadership and managerial style were not only unorthodox but positively inspiring. His approach to the management of people amounted to the systemic energizing of people, at various levels of the system, and, in the process, the empowerment of such people to become masters of their own fate:

(17) If you have the right people and you bring together the right kind of energy, then you don’t have to manage from the top and control the whole time: ‘Do this, do that; send in this report’. You only have to guide them in the right direction and create the opportunities for them; and you have to say to them: ‘That is how it works. There are guys doing this. Find out what is going on. There are enough guys with the right attitude and those guys will lead and will draw the others after them. And that was our idea at the time. We succeeded fairly well in doing in this in our own small context, and in our own small way (Peet Venter).

In the process of such empowerment, he envisioned the creation of a network of practice that, in the tradition of viral or ecological networks, was able to become an autonomous system. On the occasion of the last expo, Dr Venter delivered a short address to the delegates, knowing that the particular expo would be the last one of its kind and that Departmental support of the Project was destined to be withdrawn. His vision for the continued existence of the Project is presented below:

(18) And that last expo was a very large expo and a bit of a sad one for me because I realized that that would be the last one… I can still remember very clearly the little speech I delivered at the opening... where I told them that that expo
would in all probability be the last one, but they were not to think that that would be the end. It was only the beginning – they simply had to ensure that they kept up to date. The Internet and everything else was in place – there was nothing that could stop them. The new guys [post-1994 OFSED] could do whatever they wished. All the teachers had to do was carry on – the new Department would be such a massive organization – we were a very small department – which they wouldn’t even realize what was being done. All they had to do was carry on. They had to realize that they were on their own (Peet Venter).

The Project had, thus, in his own mind taken on a life of its own. The educators had been empowered, by means of an energizing process, to function effectively within the context of the Project system that had been created. Dr Venter’s belief that there was ‘nothing that could stop’ the educators from implementing the Project speaks of an inevitability – the view that some kind of ‘critical mass’ within the system as a whole had been reached. The point is taken up in Chapter 5 in relation to Fullan’s (2005) postulation of a ‘critical mass of leaders’ required altering the context within which a particular system is situated.

Hercules Dreyer
Dr Venter possessed qualities directly related to the successful management of the Project, and thus also the system in question, namely vision; the ability to think and plan strategically; the ability to translate strategic thinking into action plans that could be implemented in practice; and the ability to inspire and manage people in such away as to energize them.

In contrast, and almost prophetically, Hercules Dreyer, drafted into the team as an implementer, is possessed of an almost indefatigueable willingness to work. Igno van Nickerk, commenting on their collaboration in bringing the FRETEL Project to fruition, emphasizes not only Hercules’s capacity for work, but also his indomitable determination and self-belief.

(19) Hercules Dreyer – Hercules and I often drove through the night to Johannesburg and back – hardworking. He was the kind of guy – you know I am the kind of guy who sometimes wonders whether I can accomplish something – Hercules used to say that he was capable of doing something
before he even knew how it worked. And you sometimes need someone like that (Ignacio van Niekerk)

What is it that drives someone to work incessantly, without the promise of any immediate financial reward? Hercules is adamant that it is passion alone, a quality clearly observed and attested to in the fabric of the narrative that he offers. Dr Venter offered Hercules the opportunity of organising the first expo, knowing full well that the task would be approached with enthusiasm and dedication:

(20) You know, I become excited when I speak about it. That was one of the happiest periods of my life – I often worked throughout the night to get that thing organised but it was wonderful (Hercules Dreyer).

(21) That was the most enjoyable job I ever had (Hercules Dreyer)

(22) That kind of thing gave me the biggest kick and with one event you made such a difference right across the Free State (Hercules Dreyer).

(23) The other thing that we had there – can you see how excited I get about this – as I said, if they offer me a post now, I will go back immediately. If only the Free State said that they were aware of these things and asked I to get them started (Hercules Dreyer).

There is, in these comments, a sense of absolute joy and satisfaction. There is also the sense that he approached the organisation of the expo from a personal perspective: failure of the expo would have been interpreted as personal failure. The extent of this commitment is adequately and eloquently captured in his comment relating to the role that the Project played in his own life, and the traumatic effect that the withdrawal of Departmental support, and his subsequent resignation, had on him.

(24) I become terribly excited about this whole Project because it was my entire life at the time. I think we had many successes at the time and we enjoyed it because we could see the difference we were making. When I left for the private
sector it was as if a limb had been cut off. I have never again had that feeling – that feeling of satisfaction (Hercules Dreyer).

Throughout the narrative presented by Hercules there are references to the centrality of the educator’s dedication and motivation as catalysts and necessary pre-conditions for the implementation of the Project, but also for the sustainability of the project. The strategic and action plans devised by Dr Venter demanded that educational imperatives determine technological solutions rather than technology providing the *raison d’entre*. In Hercules Dreyer, Dr Venter found someone who subscribed wholeheartedly to this philosophy, and lived it:

(25) *Facilities are necessary but that can come later. Your teacher is the most important thing. You can build the most impressive schools but if you don’t have the teachers it won’t help. So, that was the difference (Hercules Dreyer).*

(26) *You need someone like Intel, like Microsoft, but you need teachers to drive the thing. That is what it amounts to (Hercules Dreyer).*

Dr Venter’s belief in the efficacy of ‘energising’ educators was greatly aided by the fact that he could hardly have found a better embodiment of the concept than Hercules Dreyer. Part of the inspirational quality of Dr Venter’s philosophy was the fact that educators could observe and experience, at first hand, what energy, dedication and passion looked like. The personal qualities possessed by Hercules Dreyer acted as perfect foil for those possessed by Dr Venter. Furthermore, each set of qualities was perfectly matched to the role to be fulfilled by each of them in terms of systemic functionality.

**Johan Badenhorst**

The Project is most often identified by participants as having been initiated and implemented by Dr Peet Venter and Hercules Dreyer. There is, however, another employee of the computer section of the Department of Education at the time who played a major role in providing support to educators. Johan Badenhorst was, in fact, the last member of the original Departmental CALIS implementation team to leave the Department. Though less vociferous and more reticent than either Dr Venter or Hercules Dreyer, he is someone who is possessed of the same passion for computers in education that characterises the former men. On being
asked to indicate why he became involved in the Project in the first place, he responds as follows:

(27) Ok, on the one hand, I became involved because it was my job; on the other hand, it was my passion – out and out.....(Johan Badenhorst)

Not only does Johan indicate his own passion for the Project, but the implication contained in his reference to some of the other members of the Departmental team in this particular context, indicates a kind of golden thread in terms of personal dedication to the cause of integrating and sustaining computers in classroom practice. This particular golden thread runs through the motivations of active participants in the Project at all levels, and will be taken up below in the discussion of the role played by educators involved in the Project.

There is, however, another aspect to this passion that is not evident in the narrative presented by Dr Venter or Hercules Dreyer. Both of the latter bemoan the short­sightedness of the Department in withdrawing support, but Johan is positively taken aback and hurt by the Department’s implied mistrust of their motives in implementing the Project:

(28) The result is that all of that equipment simply disappeared and nobody allowed one to use it or to do anything else with it – it is probably in a storeroom somewhere. That is the pity of it. One of the questions relates to how one felt about this. Naturally, one’s reaction was negative because you planned the thing with the intention of contributing to the betterment of all in South Africa, and all your good intentions were simply ignored (Johan Badenhorst).

(29) No, that was a wonderful time and it was enjoyable – we enjoyed it very much and it remains a tragedy that the thing [Project] could not be done because I don’t think either the principles upon which it was founded or the motivation for it can be doubted. These were pure (Johan Badenhorst.)

Johan’s reaction here is a conglomerate of pride in what had been achieved and a sense of sadness at the thought that their motives had been mistrusted by the Department. There is
about this sadness a depth of emotion, evident in the repetition of the point made in the extract above, which speaks of moral uprightness and pride in the adherence to principled action. This same uprightness is evident in the actions taken by both Dr Venter and Hercules Dreyer, but is not expressed as emphatically by them.

Further testimony to the important role played by Johan in implementing and actively pursuing the continued life of the Project is provided by Maureen Dale:

Johan Badenhorst was a big factor – he was actually the gentleman who came to me and approached me with Peet Venter and said will I do it (Maureen Dale).

Whereas Dr Venter and Hercules Dreyer were the flamboyant face of the Project, Johan was the efficient support system that ensured the smooth operation of the Project. He acted as the interface between educator outreach and programmatic functionality at the Department. Once again, Johan’s altruism and dedication to the cause of integrating computers into classroom practice aligns well with similar qualities in his colleagues at the time. His own unique contribution as interface between the public outreach and the programmatic functionality of the Project required exactly the quiet dedication to duty that characterises his words and actions.

The situations of Maureen Dale, Igno van Niekerk and Sarie du Plessis provide good examples of the systemic complexity of a Project of this nature. Although they first became involved in the Project as educators, their involvement later evolved into a more direct role in the Project. It would thus be fitting to include a discussion of their qualities here. Their respective decisions to become involved in the Project were, however, taken while they were educators in the classroom. For this reason, discussion of their specific qualities takes place under the ‘Educator’ sub-section.

4.3.1.5 District

In terms of personal qualities or attributes possessed by active contributors towards the implementation and sustainability of the Project, no mention is made in the narratives of such qualities.
4.3.1.6 Institution

The involvement of individual schools in the Project will be discussed in more depth when consideration is given to the programmatic and systemic aspects of the Project. What does need to be mentioned here is the initial impetus for the implementation of the Project at particular schools. Both Dr Peet Venter and Johan Badenhorst stress the fact that the possibility of becoming involved in the Project was communicated to all schools, but that the decision to become involved in the Project rested with the school. The implication is that there must have been a person or persons, either in the form of the principal or a member of the senior management team, whose initiative and vision sparked the decision to become involved:

(30) Schools were invited to apply for such computers or to become part of the Project. Schools were evaluated on the basis of their suitability (Johan Badenhorst).

(31) Schools that wanted to, that saw the need - the need for information technology, for computer literacy, for expertise and the possibilities that technology encompassed – those schools continued on their own initiative, appointed people and developed their own projects (Johan Badenhorst).

The extract from Dr Venter’s narrative further indicates that the initial decision to become involved in the Project eventually evolved into a model for sustainability, designed by individual institutions. The question that arises is the following: how was such implementation and sustainability inspired, designed and encouraged?

A first suggestion, supported by the narrative and actions of Maureen Dale, is that the principal, as chief operating officer of the school, would have been ideally placed to fulfil this role. In answer to the question regarding the driving force behind the Project at her own school, she had the following to say:

It was the principal’s hobby (Maureen Dale).

My own school, when I arrived here, they had one computer in the office block with a very tiny hard disk and one other
computer that had a double floppy – nothing else. I mean, today you are looking at a school with in excess of 130 computers – all of good, good quality. Next year I replace 40 of them in one fell swoop so all my staff, excepting for four, are totally computer literate - and that is a staff of just on 40 people. I am speaking about assistants, secretarial people – all inclusive. At one stage, only the secretary could use FRESAD and that was what it was – lock, stock and barrel. So the interest level is there – we had in-service training at school – when they saw what could be done by them, it created a thirst (Maureen Dale).

So, the principal’s passion and vision in terms of the possibilities that computer-integrated education offered, is one suggestion as to why the Project succeeded at individual institutions. But it is also clear that Maureen possesses the necessary management skills commensurate with her position as principal of the school, to have ensured that the implementation and sustainability of the Project could be achieved.

The principal of a school certainly plays a major role in introducing and sustaining new programmes at a school, but it is essential that support come from the heads of departments, or senior management team as it is now called. In this regard, Dr Venter highlights the horizontal, networked functionality within the Project in terms of cooperation between individual heads of departments across schools:

(32) What did possibly survive was individual subject heads at schools that helped each other (Peet Venter).

But the important role played by the heads of departments was not only horizontally effective, but also vertically effective. Ronel Calitz was the equivalent of a head of department at her school and was tasked with the management of the Foundation Phase. What is immediately apparent is the importance of vertical accountability (Fullan, 2005):

(33) In the end, we simply got hold of old computers and put them in all the Foundation Phase classes (Ronel Calitz).

(34) And that was a kind of threat, also because they were not computer literate and because they dissociated
themselves from computers. But, as we progressed, the situation improved and those teachers at Taibos – the Foundation Phase people – were never really computer literate and yet they used computers in their classes (Ronel Calitz).

Once again, the vision and initiative of the head of department is strengthened by management skills. The full extent of these management and inter-personal skills will become more apparent in the discussion of Ronel’s approach as educator.

In terms of institutional uptake, it is to be expected that the personal qualities possessed by principals and heads of departments should have influenced the success of the Project. What might not have been expected to play a role is the marital relationship between individual actors at various structural levels. Ronel’s husband was, at the time, and is, the headmaster of a nearby school. He decided to implement the Project in his school:

(35) No, but he implemented the same project at his school and it worked exceedingly well – even today (Ronel Calitz)

The fact that the Project was implemented and sustained simultaneously at the two schools can only have been influenced positively by the horizontal marital relationship between Ronel and her husband.

Further evidence of the horizontal functionality of such marital relationships is provided by Sarie du Plessis:

(36) I was responsible for the primary school and my husband, Louis, was at the high school. We taught there [Clocolan] together. He was at the high school – responsible for the senior classes – and he was more involved in computer literacy rather than support in a particular learning area (Sarie du Plessis).

The fact that Sarie was responsible for the implementation of the Project in the primary school and her husband for the implementation of the Project in the high school, suggests that horizontal networking and mutual support strengthened the vertical implementation of the Project at the school. Once again, systemic interrelatedness precludes simple cause-effect
conclusions regarding the success of the Project at institutional level. Marital relationships are a systemic influence that lies beyond the pale of that which could have been designed programmatically. Similarly, such relationships are not synonymous with the personal qualities (per se) possessed by individual people involved in the Project. Rather, such relationships form the fabric of a systemic network or web that demands attention to complexity and multiple causality and effect.

In this regard, it is also difficult to ascertain the extent to which the personal qualities possessed by educators involved in implementing the Project, can be separated off from institutional and other systemic influences. What is overwhelmingly evident from the narratives produced by participants in the study, however, is that the personal qualities possessed by educators involved in the Project are perceived to have had a very meaningful influence on the implementation and sustainability of the Project at individual institutions.

**4.3.1.7 Educator**

From the perspective of the people involved in the planning and implementation of the Project for the OFSED, it was decided from the beginning that educators should not be compelled to take part; in fact, access to the Project for individual educators was purely voluntary. This decision was not coincidental. It was felt that educators keen to take part in the implementation of the Project would possess exactly those personal qualities and attributes that would be crucial to the success of the Project.

(37) We identified the schools and they then identified the teachers – look, they could then decide which teachers were keen to be involved. We did not want to oblige anyone to do it. We were adamant from the beginning that it would not help to force people to do things in particular ways. We told the school what we would give them and it was up to them to identify a teacher who was interested and in whose class the computers could be placed. So, the initiative came from the schools (Hercules Dreyer).

Although institutions were selected for participation in the Project on the basis of having satisfied a number of criteria, the most important criterion, namely the passion, interest and drive of the educators involved, was addressed by way of self-selection.
There were a whole number of factors that played a role but I think one of the most important factors upon which successful participation depended was, in the final analysis, the teacher’s dedication – commitment – to the Project; whether it was positive, and, of course, the teacher’s enthusiasm – the teacher’s drive was a very important factor because if it is simply dumped on a teacher, you can forget about it (Johan Badenhorst).

The efficacy and eventual wisdom of this decision, in terms of the success of the Project, is emphasized by Hercules Dreyer:

It is incredible what guys can do but the teacher needs the energy. And unbelievable teachers came to the fore – notably Sarie and Louis whom we later moved to the studio – they were in ....I will have to guess... Clocolan was where they taught (Hercules Dreyer).

But the perception was not, simplistically, that specific positive qualities possessed by individual educators would guarantee success. It was accepted, from the inception of the Project that such qualities functioned dynamically within larger systems – systems that were likely to evolve and change character over time. One such immediate interrelationship was perceived to be that between human qualities and hardware / software infrastructure.

The next phase – great, now we have the infrastructure. We had had computers placed at schools. The large corporations simply delivered them – who was going to drive the Project? Who ensures that lessons are designed on an ongoing basis, and that energy is maintained – that the thing even gets off the ground? That is where the thing works – that is sink or swim. That was why I worked through many nights – to evoke the energy. You have to motivate guys (Hercules Dreyer).

In terms of evolution of the system, the expectation was that the Project would develop, change and expand in accordance with viral or ecological models (Cavallo, 2004) of
sustainability, where the activities and successes of individual educators would inspire those closest to them to embrace the implementation of the Project. These educators would then inspire those closest to them. In this way, horizontal networks of practice would come into being:

(41) What enabled these schools to do this? Drive. It is the drive provided by teachers who are enthusiastic that enables things to run (Johan Badenhorst).

(42) You will not be successful, and the intention from the start was to involve the enthusiastic teacher and to get him into the system, and in this way you could involve your other teachers who would become aware of the successes of the first teacher (Johan Badenhorst).

(43) If those funds dry up and there are no longer people who do it – here and there where something had been planted in fertile soil, it might have persisted (Hercules Dreyer).

The enthusiasm of educators for the Project and the time and energy that went into the implementation and sustaining of the Project, beg the question as to what might have motivated educators to become involved in the first place. The introduction of computers into classroom practice not only presented educators with novel ways of enhancing learning, but also acted as motivational tools in terms of the learners’ engagement with the various curricula. In this way, the Project encouraged something that educators had consistently striven towards achieving: the awakening of curiosity amongst learners, and even excitement at the prospect of engaging with learning materials.

(44) I think that the most important achievements, successes that we managed are related to this issue. In the end, the most important success is when you ... see a child sitting in front of a computer and his face suddenly lights up and he gets a different expression on his face - that is where the teacher’s reward lies and, for us, that was the success of the Project (Johan Badenhorst).
Even after the decision had been made by the OFSED to withdraw support from the Project, Johan Badenhorst received many queries from educators – indicating that withdrawal of official support had not been synonymous with cessation of activity on the part of educators:

(45) We still received many queries and, because I was the only one who was left, I had many queries and I tried to give guys advice, as far as were possible, but only so far as I was permitted to help. But that was not nearly as much support as we should have given (Johan Badenhorst).

The managers of the Project at the OFSED, in the form of Dr Peet Venter, Hercules Dreyer and Johan Badenhorst are thus unanimous in their appraisal of educator drive as a major contributing factor that led to the sustainability of the Project. This point will be addressed in more detail in the section relating to metaphoric patterning. The question which now arises is the following: what role do educators themselves perceive educator drive to have played in the implementation and sustainability of the Project?

Igno van Niekerk

At the time of the Project’s implementation, Igno van Niekerk taught English at Voortrekker High School in Bethlehem. His interest in the Project was sparked by the enthusiasm of Hercules Dreyer, who visited the school at the time. But that was not the primary reason for his decision to become involved in the Project. In the ensuing extract, he identifies ‘natural curiosity’ as the driving force behind his decision to embrace the Project. This quality is also mentioned in Sarie du Plessis’s narrative as one of the essential attributes of educators who embrace technology, and change in general:

(46) Why did we get involved? I think it was the involvement of Hercules Dreyer – and something I wish teachers today still have: the desire to know more (Igno van Niekerk).

Igno wistfully bemoans the fact that present-day educators seem to have lost this crucial characteristic. He does, however, admit (later in the same narrative) that the CALIS Project was also only embraced by a handful of educators who were ‘hungry’ for improvement:

(47) What I found very sad was the fact that it was only a small group of teachers who were involved and who were
enthused, but there was a large group of teachers who were not involved and who were not enthusiastic (Igno van Niekerk).

The full effect that involvement in the Project had on Igno is described in the extract below. This effect was not only a change of attitude towards technology in general and computers in particular, but amounted to much more than this. His involvement in the Project positively changed the way in which he approached his teaching. Furthermore, his interest in the relationship between computers and education, sparked by the Project, eventually led to his appointment in the training section of Liberty Life.

(48) I mean the fact of the matter is that I had a very positive experience. I learnt an unbelievable amount (Igno van Niekerk).

(49) That is how I see it – how it changed my life. My life changed completely as a result of one CALIS Project (Igno van Niekerk).

Igno’s involvement was not only cerebral or intellectual. It was not only academic. Just as Dr Peet Venter, Hercules Dreyer and Johan Badenhorst had been imbued with a passionate determination to make a success of the Project, evidence of emotional involvement is also expressed in the following extract from his narrative, detailing his sense of loss at the studio that is seen as having gone to waste:

(51) It is sad – I think the teachers’ centre, the studio does not necessarily exist anymore, neither the expensive camera nor stuff (Igno van Niekerk).

Such emotional involvement coupled with the kind of determination, echoed by the willingness to go to some lengths in ensuring the continued existence of the Project (extract below), suggest determination and a personal commitment to the success of the Project.

(52) So Sarie and I started playing the following game: when the teachers’ centre was in trouble, we worked for the Department, and when the Department was in trouble, we worked for the teachers’ centre (Igno van Niekerk).
There is also consistency between the qualities visible in Igno’s actions and the opinions expressed by him on the subject of the qualities to be possessed by educators who were likely to make a success of the Project. He tacitly acknowledges the systemic interrelatedness of different, specific skill sets at different structural levels of the system. Not only is there a place for the visionary strategist (Dr Venter), but such vision has to be supported by principals at individual institutions who are willing to translate strategic thinking and action plans into concrete implementation. Also, educators who choose to become involved in this kind of project, are, in the first instance, pioneers (to be discussed in greater detail in the section involving metaphoric patterning); they are, furthermore, possessed of a ‘good eye’, or sound judgement. This quality could also be interpreted as referring to the ability to comprehend the systemic value of a seemingly isolated Project:

(53) It’s the old story – you always have your visionary, and if he can only provide the vision, then you will have a few pioneers who can take things further (Igno van Niekerk).

(54) It all depended on the principal, and then someone on the staff with the drive and a good eye (Igno van Niekerk).

Beyond these qualities, Igno is adamant that the only reason for the continued existence of the Project after the withdrawal of government support was the hunger, energy and drive possessed by educators in the classroom. The extracts presented below, in fact, imply that this single contributing factor to the sustainability of the Project is often underestimated:

(55) What made schools carry on? There is only one thing that enables a school to carry on with computers: one teacher with the guts and the enthusiasm. You have one guy who has the drive and the energy and the enthusiasm. And he does it in spite of the syllabus, and he does it at any time: he does it in the afternoon; he does it at night (Igno van Niekerk).

(56) A person should never underestimate the ability of one teacher with energy at a school, and that is the thing. You know, when you slice open an apple, you can see how many
seeds there are, but when you only have seeds, you do not know how many apples there are. I think they planted many seeds and we don’t even know what happened to those apples (Igno van Niekerk).

He is also of the opinion that such motivation and drive can be linked to the willingness to be engaged in lifelong learning. It is an internalized quality that not everyone possessed.

(57) The perception at the time was that after four years you obtained your H.D.E [Higher Diploma in Education] and that you had finished studying, and the idea at the time was that we had to resurrect the concept that you had to become a lifelong learner. But that was something that had to be internalised – it was not something that people simply had (Igno van Niekerk).

Expanding on the nature of this motivation or drive, Igno claims that such drive is an expression of the educator’s view of his classroom intervention as a calling rather than merely a job. The point here is that educators experience their success in terms of the perceived difference they make to the lives of learners, rather than in material terms.

(58) But there is still your teacher for whom it is a calling – people who realise that you can make a difference to the lives of children (Igno van Niekerk).

Even when Igno does speak of incentives he would like to see modern-day teachers provided with, the incentives are couched in terms relating to improved learning and teaching rather than the personal enrichment of educators themselves.

(59) If I consider that kind of teacher – I would look at a system that rewards the guy with a computer in his class, or something like that (Igno van Niekerk).

In this sense, the sustainability of the Project was ensured by the incorporation of computer-integrated classroom practice into the mainstream of the learning-and-teaching programme by educators of this nature. It follows that educators appointed subsequently at such institutions
would have accepted, possibly unconsciously, the use of computers in classroom practice as an integral part of the academic programme.

(60) So, yes, I would say that many of them carried on using it [Project] – I don’t think they would say that they used it consciously – some of them don’t even know what CALIS is (Igno van Niekerk).

In this way, qualities possessed by individual educators, according to Igno, played a major role in guaranteeing the successful implementation of the Project and subsequent sustainability thereof.

Maureen Dale

Maureen Dale’s situation, as far as the participants in this study are involved, is unique on two counts. The first is the fact that she speaks English as a home language, whereas the other participants speak Afrikaans as a home language. The second is that she was the principal of Eunice Primary School when the Project was implemented there. Mention has already been made of the central role played by the principal in the implementation and sustainability of the Project. In Maureen, the motivation and drive mentioned by Igno is complemented by the organisational and managerial competencies associated with principalship. On being asked why the Project had succeeded at Eunice Primary School, her answer was unequivocal:

And I am afraid that’s the bottom line. It – I love computers. It’s what I taught – it’s what I did best – so for me it was so! exciting to impart that knowledge to other people and to let them see what excited me so - and the bug – they all took it. If I had been a pen-pusher and not been as computer-literate as I personally was, I wouldn’t have been that interested in getting it off the ground – so the interest level on the – being the principal of the school at that time was accidental. They approached the person and asked me to do it (Maureen Dale).

Coupled with the motivational drive and managerial capability, was a determination to ensure that the Project succeeded not only in individual classrooms, but throughout the systemic
functionality of the school as a whole. Contained in the account presented below is an evaluation of the Project as a means of addressing personal growth, irrespective of age:

They could physically walk from stall to stall to see what there was available and what they could be doing – and hell – I can’t – and I want to! The oldest member on my staff, and I am only speaking – specifically - from a Eunice point of view, the oldest member learnt to use a computer when she was 68. She was my bursar – she had never used one before. She could type, and when she left here she had the entire inventory on computer. So she really- she could do it. And the wonderful feeling of achievement and success. I mean, you’ll never take that away from her (Maureen Dale).

It was quite possibly this unique combination of personal attributes that influenced Dr Venter’s decision to approach Maureen regarding the hosting of the annual expo at Eunice. In this way, the energy, drive, determination and organisational expertise that had characterised the implementation of the Project at Eunice informed the larger system of the Project as a whole.

(61) As I said, Maureen Dale was involved in the enrichment programme at the teachers’ centre for a number of years. We worked together very closely and knew each other well. I knew that if you gave her half a chance she would make a success of something. As a result the last expo was at Eunice – we sort of knew that that would be the last one as a result of the new guys coming in (Peet Venter).

(62) And she can organise something very well – she is a livewire as far as that is concerned (Peet Venter).

She embraced her new role and the expo was approached with the same gusto that had characterised the implementation of the Project at her school.

And because of my interest level at that stage. I would have moved heaven and earth to get the things that I wanted to see
and we brought them here and it was a rip-roaring success (Maureen Dale).

I upgraded the infrastructure of the hall – we actually got days off of school so that the pupils didn’t have to come to school that day because we used their classrooms as well – which was quite nice for them (Maureen Dale).

The full extent of Maureen’s commitment to systemic functionality is, however, best testified to in a comment made by Igno. On having his presentation lesson at the expo chosen as the best lesson (after Ronel Calitz was unable to take up the prize she had won), Igno was awarded an all-expenses paid visit to the WCCE Conference in Birmingham in 1996. Maureen co-sponsored this trip:

(63) …with people like Maureen Dale, who is an unbelievable character (Igno van Niekerk).

(64) I will never forget Maureen Dale since she provided the funds that enabled me to go overseas (Igno van Niekerk).

Maureen’s focus was thus not merely her own school, her own district or the region in which she found herself. She embodies, in her actions and attitudes (as do the other participants in this study), the kind of systems-thinking-in-action described by Fullan (2005).

**Sarie du Plessis**

Just as both Igno and Maureen were initially involved as educators at individual institutions but later became involved in the regional functioning of the Project, so also Sarie was initially involved in the Project as an educator at the primary school in Clocolan. She was later drawn into the regional functionality of the Project. On being asked why she decided to implement computers into her classroom practice, she identified a very specific personal attribute which she views as a prerequisite for educators wishing to do this. There are echoes here of the ‘natural curiosity’ mentioned earlier by Igno, but there is the added appreciation of that which is new and innovative. There are also echoes here of the metaphor employed by Igno, in terms such educators as ‘pioneers’.
(65) The other reason was that I found it interesting – something new. It was something different – that’s why I decided to do it (Sarie du Plessis).

(66) But I think that it has to come from inside – one must be fond of new things. In other words, you must have the ability to explore. New things should not cause you stress. You must be able to say: ‘Ok, let’s see what we can do with it’. I think if you have those qualities, you can progress. They don’t have to drive you – you have to be able to motivate yourself and you have to be able to design your own projects. You have to be able to see that a, b and c will work in the classroom situation and then you have to implement that (Sarie du Plessis).

In addition to this appreciation of innovation is the, by now, familiar emphasis on the drive and commitment of the individual educator as an important contributing factor to the successful implementation and further sustainability of the Project.

(67) Yes, I think what makes it possible for a school is the fact that you really have to have a committed teacher (Sarie du Plessis).

In the view of Igno van Niekerk, Sarie does not merely espouse such qualities but quite literally embodies them. Such commitment has enabled her to weather the withdrawal of government support of the Project in 1996 and has ensured that, even today, in her daily functioning at the OFSED, she actively strives for the integration of computers into classroom practice across the region.

(68) …and what has to be said is that Sarie has an inner drive…(Igno van Niekerk).

(69) Old Sarie still does this kind of thing today. She does programmes and that kind of thing. If it had not been for those kinds of people, things would simply have come to a dead end (Igno van Niekerk).
Once again, it is not the promise of material gain or financial enrichment that motivates the educator. Sarie endorses the view expressed earlier by Johan Badenhorst that motivation for educators such as her lies in the perceived difference made to the lives of learners.

(70) Why did they carry on? I think there was great inspiration – you could see the difference that it made to the lives of the children (Sarie du Plessis).

The kind of motivation, determination and energy possessed by educators such as Sarie also influenced some of them in previously unforeseen ways. After his return from Birmingham, Igno was offered a position at the OFSED and was seconded to the FRETEL Project. When this Project was officially abandoned by the Department, he applied for a post at Liberty Life in their training section. Just as Igno had been appointed to the training section at Liberty Life, Sarie’s husband, Louis, was appointed to the same division. Sarie herself later joined the Computer Planning Section of the OFSED and was seconded to the FRETEL Project, where she worked with Igno. All of these roles have one thing in common, namely the use of technology in education and training environments.

(71) I don’t know. I don’t know whether there are still those who use computers. [Are you aware of any of the originally selected schools or teachers who still use computers effectively today?] Yes, I think many of the teachers who were involved in CALIS use computers today (Sarie du Plessis). 

(72) He [Louis, her husband] works with Igno. And I would say that both Louis and Igno have CALIS to thank for the careers in which they find themselves today - that was where they started. I went from CALIS to the Department, first in an administrative role and later with Hercules as part of FRETEL. When he left, Igno and I carried on with FRETEL. Currently, I am with ELITS, Education, Library and Information, where I produce videos. But I am also involved in computer training. So CALIS opened up new horizons for me (Sarie du Plessis).
Ronel Calitz

Like Igno, Maureen and Sarie, Ronel Calitz was first introduced to the CALIS Project as an educator at a school in Sasolburg. Unlike the former, she never became directly and officially involved in the management of the Project at the time. But, as is the nature of systemic interrelatedness, her pedagogical interest in developing a reading programme for the Foundation Phase, though only tangentially related to the official concerns of the management of the Project, was later to play a major role in ensuring the sustainability of the Project.

Ronel conducted extensive research into the existence of remedial reading programmes after it became clear to her that the learners in the Foundation Phase at her school were not showing the necessary progress in reading. The problem is that the traditional approach to addressing shortcomings in literacy, involving written exercises, could not be employed at all in the Foundation Phase. An alternative solution had to be found.

(73) In 1992 we developed a reading programme for the computer – it worked really well (Ronel Calitz).

(74) Because we were involved in the Foundation Phase we were not able to let children write compositions and things like that (Ronel Calitz).

Ronel’s research led her to the discovery of a programme that addressed remedial reading by way of a projector and slides. It was at that point that she approached her brother, who was a computer enthusiast, to enquire whether the programme could not be redesigned for computer delivery.

(75) I was never a Foundation Phase teacher but was involved with the Grade Fours, Fives and Sixes. They could not read and that drove me mad. You know, I could not handle that. So I started doing research on reading and possible reasons why children could not read, etc, etc. At the time there was a programme on the market – you used a projector that flashed words. I went to the University of Potchefstroom because they were the experts who used or marketed that programme. And I visited Dore Human at the University of the Free State since she used certain programmes. These were electronic projector programmes.
When we started with computers I approached my brother who was a computer boffin. And I said to him: ‘Man, this stuff that is projected – surely it can be put onto computer’ And so, with all the knowledge I had accumulated over the years regarding remedial reading, and his computer expertise, we developed the programme. And the programme thus had greater potential and was actually much better than the programmes that made use of projectors. You had much more freedom. And that was how the CALIS Project became part of my lessons – part of my lesson planning. I presented a reading lesson with different reading stations, of which the computer-based programme was one (Ronel Calitz).

The computer-based programme was duly developed and it was in marketing the computer-based reading programme that she became aware of, and became involved in, the CALIS Project.

(76) You know how I became involved? I was already in the process of marketing the reading programme (Ronel Calitz).

Whereas the simultaneous marketing of the reading programme and the initial implementation of the CALIS Project must have been fortuitous from Ronel’s perspective, Igno is of the opinion that the quality and usefulness of the reading programme was such that schools would have purchased the programme irrespective of whether the CALIS Project had been implemented or not.

(77) Ronel was personally involved but she carried on with the Roos Reading programme on her own. She used dongles in order to ensure that the programme could not be copied. She marketed it and it was something that schools would have purchased in their private capacities (Igno van Niekerk).

From the perspective of her own involvement in the CALIS Project as an educator, there are two factors that play a significant role. In the first instance, the development of the reading programme had made her critically aware of the integration of computers into classroom practice, and, in the second instance, Ronel had decided to enrol for the M.Ed
Degree in Computer-integrated Education at the University of Pretoria. In this sense, she was well-prepared to take up the challenge of implementing the CALIS Project at her school.

(78) At that stage I worked a lot with integration – computer integration but also integration in general (Ronel Calitz).

(79) You see, for me it was a great success because, at the same time, I was recruited to do Johannes’s master’s programme. I did it and enjoyed it very much (Ronel Calitz).

The inquisitive and entrepreneurial spirit that first sparked her interest in conducting research into and developing the computer-based reading programme is only one of the qualities that Ronel sees as contributing to the successful implementation of the Project at her school, Taibos Primary. Igno’s description of ‘natural curiosity’ and Sarie’s emphasis on innovative thinking find support in Ronel’s narrative:

(80) It was always people enjoyed experimenting with new things. I am one of those people and Linda is also one of those people. And as it always goes, people have to buy into the idea (Ronel Calitz).

Allied to these qualities, Ronel reiterates the importance of personal commitment to the success of the Project, on the part of the individual educator, as a prerequisite for success.

(81) Nowadays, there are computer centres in many of our black schools and they are white elephants since many of the schools have nobody to drive the process (Ronel Calitz).

But, as might be expected of someone responsible for the organisation and management of the Foundation Phase at her school, personal commitment and drive are not seen as the only necessary prerequisites for success. Determined action has to go hand-in-hand with careful planning, coordination and a thorough and deep knowledge of one’s subject matter. So, successful and sustainable integration of computers into classroom practice depends as much on academic/pedagogical and managerial competence as it does on personal qualities relating to motivation, curiosity and inner drive.
(82) You need to plan very carefully if you want to apply computers in the curriculum (Ronel Calitz).

(83) If you want to work in a structured way you have to have incredibly good organization in such a classroom. It really has to be someone who knows his subject (Ronel Calitz).

(84) You could not expect people to do it because it was a skill – it was really a skill, and it was the same at his school [her husband’s school]. And he, as principal, could not expect of teachers to present structured group work in their classes involving the computer (Ronel Calitz).

Further proof of the veracity of comments relating to the importance of personal qualities possessed by the individual educators concerned is provided by Ronel’s departure from the school. The Project, initially implemented at Taaibos at the same time as other schools in the region (1992-1994), continued functioning successfully even after the withdrawal of official government support. When Ronel left the school in 1998, however, the Project fell into disuse and was eventually abandoned. Ronel’s departure coincided with the appointment of a new principal and deputy-principal who were not sympathetic to the learning–and–teaching strategy employed by the school at the time. This particular learning-and-teaching strategy will be discussed in more detail in the section dealing with programmatic characteristics of the Project.

On being asked whether she thinks the Project would have had a longer life at the school had she stayed, there is no hesitation at all in the answer.

(85) Once I had left, there was nobody to oversee the upkeep of the computers (Ronel Calitz).

(86) It was in 98.99 – somewhere in that region. I think it was in 98, and so, in the end, it did not work anymore (Ronel Calitz).

(87) DO YOU THINK, AND THIS IS A DIFFICULT QUESTION TO ANSWER, THAT THERE WOULD
HAVE BEEN SOMETHING LEFT OF THE COMPUTER INFRASTRUCTURE AT THAT SCHOOL, HAD YOU NOT LEFT?

_O yes, definitely. Definitely (Ronel Calitz)._ 

Once again, Ronel exhibits an interest and a focus that extends, systemically, well beyond the bounds of her individual classroom. Not only was the computer-based reading programme intended as a solution for learners across the country in need of remedial reading interventions, but she also instituted a revolutionary approach (at the time in South Africa) to involving parents in the education of their children. The adoption of the learning-and-teaching strategy advocated by Hercules Dreyer was implemented with the help of needy parents who could not always afford school fees, but who were willing to give of their time in acting as monitors in the Foundation Phase classes. The effect is poignantly captured in the words of one of the mothers who acted as one of these monitors:

(88) _Anna: O, a lot. It gave me back my dignity. Ok, you don’t know my history but it made me human again and I tell you my self-image was much, much better. And with the computer courses under my belt I feel tops. I can say that it gave me an injection... (Anna: Ronel Calitz)._

Ronel’s husband was the principal of a nearby school at the time and was similarly involved in implementing the Project at his school, although his implementation strategy in terms of learning and teaching was totally different to the one followed by Ronel. The socio-economic make-up of the learners at his school, coupled with a dearth of resources, necessitated (in his view) a radically different approach. Although the Project steadily lost ground at his school and finally disappeared altogether, as mentioned earlier, the marital relationship between them, though not directly characterised as a personal quality, is recognisable as a quality of the network of relations within which personal attributes find expression. The strengths of these relationships are likely to have affected the successful implementation and continued sustainability of the Project.

(89) _His was one of the first integrated schools – transformed schools – and the crisis was the large differences between the children (Ronel Calitz)._
(90) He then used these computers and he used games to stimulate the children – because there are certain basic things – and I am also a big supporter of computer games – like hand-eye coordination and that kind of thing (Ronel Calitz).

(91) The children did not know computers and he made them available during the afternoons and during breaks and the children was crazy about them – you can imagine (Ronel Calitz).

The narratives thus produced by the participants in the study provide a small number of very clearly defined personal characteristics or attributes associated with educators who were able to implement and sustain the CALIS Project in their respective schools, namely motivation; drive; appreciation of innovation; curiosity and the willingness to explore; organizational and managerial expertise; and a passion for contributing towards the success of the Project.

In terms of the structural levels identified at the beginning of this chapter, all have been addressed, except one – the learners. Were there any personal attributes or characteristics possessed by, and associated with, the learners that might have contributed to the success of the Project?

4.3.1.8 Learners

Hercules Dreyer and the mother who had acted as a monitor in Ronel’s classroom agree that there is one quality that contributed actively to the success of the Project. This quality is perceived to be universal, however, and is not seen as having been possessed by participating learners only. Children are naturally inquisitive, but this natural curiosity is not tempered by the fear of failure as is the case with adults. Children explore wholeheartedly and fearlessly, and this was exactly the quality with which to confront the strange and precipitate appearance of computers in their classrooms. The perception amongst learners was that they were having fun, and not that they were necessarily involved in learning. There was thus no lack of intrinsic motivation.

(92) I even recorded video material of the Project. I remember walking into a teacher’s class in Parys and saying
to her: ‘Let’s quickly load these programmes for you.’ And they were simple freeware programmes and the children were Grade Twos. The children were small and had never worked on computers before, but within half-an-hour they were playing on the computers. They were completely at ease. The thing about little ones is that they are not afraid – they don’t worry. The teacher stands and worries and worries, and you just have to say to him: ‘You know, you just have to ask the children – they will show you. Don’t worry’ (Hercules Dreyer).

(93) Anna: Yes, and when you arrive there, you tell them to sit down so that you can switch on the computers. When you look again, the computers are on and they are typing on the keyboards. They say: ‘Lady, don’t worry’, and they press F1 or F4 or something else. And they simply continue (Anna: Ronel Calitz).

(94) Anna: O, they used to fight – they used to beg us: ‘Can’t we please go on for a little while. We want to read, or we want to fill in words or we want to do Mathematics – can’t we work for a little while on tables and counting and…(Anna: Ronel Calitz).

It therefore comes as no surprise that the Project is seen as having been a resounding success in terms of learner motivation and performance.

(95) Anna: Definitely, the computer training – or should I say the training that they had there – really helped. Truth is told, my children also received the training and I tell you it really helped them – gave them a wonderful boost (Anna: Ronel Calitz).

At the beginning of this section a number of questions were posed regarding the influence of personal character traits on the implementation and sustainability of the Project.
In the first place, it is not possible to separate implementation from sustainability. It is impossible to establish when Ronel’s implementation of the Project ended and when her efforts towards sustainability began. What we can say, however, is that the Project failed at her school when the principal, the deputy-principal and Ronel Calitz left the school. We can also point out that Maureen Dale is still the principal at Eunice Primary School and that the integration of computers into classroom practice has flourished at her school.

Secondly, the preceding discussion of the character traits possessed by individual people at the various structural levels of the system indicates clearly that the requisite character traits on each structural level are not generic. Furthermore, in the case of the CALIS Project, the personal qualities possessed by the particular people on each level happened to coincide with exactly the qualities demanded for the success of the Project.

Finally, the preceding discussion reveals that, given the complexity of systemic interrelatedness, the participants in this study do have one quality in common: the ability to think and act both locally and systemically. Their strategies, plans and actions are suggestive of a commitment to the sustainability of the system as a whole and not only a commitment to the sustainability of their immediate contexts. Such commitment found expression in the programmes they developed.

4.3.2 Programmatic influences

Programmatic influences on the implementation and sustainability of the CALIS Project are defined earlier in this chapter as those influences relating to the Project that had been planned and implemented, with the specific goal of contributing to the success of the Project. On the face of it, this definition seems to be fairly unproblematic. Again, systemic interrelatedness precludes any such simplistic teasing out of individual, unitary influences.

The first complicating relationship is that between the CALIS Project and the existence of a pre-established programmatic infrastructure geared towards bringing about the computer literacy of all white educators (pre-1994 OFSED) in the Free State. This computer literacy programme was to be presented at education centres throughout the Free State. These centres had previously been established so that learners wishing to study Computer Science as subject could receive such tuition at the centres, since the relevant expertise did not exist at schools at that time. The question arises as to whether these initiatives, programmatic in nature – according to the definition provided above, did not have such a direct influence on the implementation and sustainability of the Project that they must needs be considered part and
parcel of the programmatic influences addressed in this section. The extrication of programmatic influences from the systemic network in which they are situated, as presented here, is thus artificial.

Secondly, the oversimplification of systemic interrelatedness is further exacerbated by the nature of the Project itself. The CALIS Project must be viewed within the wider context of the programmatic strategising around the integration of computers into schools at the time. As discussed below, the intention had always been to introduce computers into schools as administrative tools (via the Orange Free State Administration Database or FRESAD), as a precursor to introducing computers into classroom practice. The CALIS Project was thus the programmatically determined next step in terms of ensuring a more sophisticated use of computers in terms of learning and teaching. Furthermore, the implementation of CALIS coincided with the implementation of two other programmes that were designed to support the Project, namely FRENET and FRETEL. FRENET (Free State Education Network) was designed to connect all schools in the Free State to the Internet and thus also to the OFSED. The idea was that communication between individual schools, and between the OFSED and individual schools, could take place effectively and cost-efficiently. FRETEL (Free State Educational Television) was a satellite-based television network that connected education centre across the Free State with the OFSED in Bloemfontein. Not only was the network to be used as a management tool, but the idea was also that quality educational programmes could be broadcast to distant resource-poor rural areas.

Once more the question arises as to whether CALIS can meaningfully be separated off from FRENET and FRETEL in terms of programmatic influence, as defined in this study.

The approach followed thus far in this chapter, relating to the various structural levels at which influences might be identified, will serve as a useful way of identifying tangential programmatic influences on the implementation and sustainability of the Project. The focus will, however, still fall on the CALIS Project itself.

4.3.2.1 International

When Dr Venter was appointed by the OFSED to the position of head of the computer section, he was instructed to bring about the full integration of computers into learning- and-teaching at schools throughout the Free State. He was to build upon the positive attitudes towards computers that had been fostered amongst principals by the implementation of the FRESAD programme. It was clear, however, that the full integration of computers into the
curriculum is far removed from the use of computers for administrative purposes in schools. The implementation and sustainability model would have to be designed anew.

As mentioned previously by Hercules Dreyer, Dr Peet Venter, ever the strategist and planner, decided to embark on extensive research into the viability of equivalent programmes in other countries. Such research was supplemented by a visit to institutions in the United Kingdom and the United States of America where similar programmes had already been implemented. The delegation, of which Hercules Dreyer was a member, also attended a conference in the United States, aimed specifically at addressing the integration of computers into the classroom. As indicated in the ensuing extract, the purpose of the visit was to test the hypothetical planning that had taken place prior to the visit against the reality of implementation in other countries.

(96) We spent a few days in London and then visited Newcastle – there was a university that did quite a bit of work. At the time they had Archimedes computers and they wrote software specifically for those computers. We visited them to see what they were doing. Then we travelled to America where we attended the National Computing Conference – a massive conference with 3,5 thousand delegates. The theme of the conference was the use of computers in the classroom. The most important thing that I brought back from the Conference (we visited a number of schools throughout America) – the Internet had just got going and we had to phone guys to make contact. We visited software development companies that ran various projects and learnt very, very interesting things there. My feeling on returning to South Africa was that we were slightly ahead of England in terms of our ideas and the things we wanted to implement, and on a par with America. The things they wanted to do and the things we wanted to do were the same. The only difference was that they had the money and we did not yet have enough money at that stage (Hercules Dreyer).

The conclusion reached by Hercules Dreyer was that the planning that had preceded the overseas trip had been endorsed by that which had been observed at the National Computing Conference and the various institutions that they had visited. The insights provided by the trip
thus convinced the delegation that the theoretical underpinning envisioned for the ensuing CALIS Project had been tested by way of practical implementation and found to be sound. They were not oblivious to the important contextual differences between the implementation in these countries and the situation in South Africa. As mentioned, the most visible difference was seen to be the availability of funding.

But there were also other, less glaring but equally crucial, differences. Because of adequate funding, it is likely that institutions in the United Kingdom and United States of America did not need to compete for funds. This meant that there was no competitive barrier to cooperation and sharing across institutions. The willingness to share and the kind of secure environment in which educators felt at liberty to make mistakes were attributes of the system, underlying the implementation of similar programmes in the United States. This immediately made an impression on Hercules Dreyer – exactly because the system underlying the proposed implementation of CALIS in the Free State in South Africa was completely different.

(97) - because that is the second thing I wanted to say just now: what I realised in America was that guys didn’t mind sharing and they didn’t mind making fools of themselves (Hercules Dreyer).

One of the challenges faced by those who were to implement the CALIS Project was the fact that the culture of cooperation and sharing, motioned above, was precluded from the South African context by the competition for scarce resources. It was a culture that would have to be addressed if the CALIS Project was to be sustainable in terms of systemic, networked functionality.

4.3.2.2 National

Just as Dr Venter had conducted research on the integration of computers into the curriculum in other countries, he evaluated the South African context in terms of similar expertise. The conclusion reached, as indicated earlier, was that the University of Pretoria programme in Computer-integrated Education represented the most advanced expertise in the country. With this in mind, the trip to Pretoria was undertaken and the cooperative agreement, mentioned earlier, was sealed. So began an agreement that had far-reaching influences on the implementation and sustainability of the Project, as has already been mentioned.
We them travelled up to Pretoria one day in order to visit them. We asked them whether they would be prepared to enter into a kind of partnership with us - with our little group in the Free State. They could advise us and conduct research in the Free State; they could use their students to do the work in the Free State and we could then benefit from their knowledge. They were very anxious to help, and very pleasant, and we then formed a very nice group (Peet Venter).

We did the same thing again – Johannes presented a number of keynote addresses in his own brilliant way – as is usually the case (Hercules Dreyer).

Ronel Calitz claims that her approach to learning-and-teaching, and more specifically the methodology that she adopted concerning cooperative learning, was gained as a result of her enrolment in the M.Ed. in Computer-integrated Education at the University of Pretoria.

I learnt a lot – also because it was so closely related to what we were doing, and also cooperative learning and stuff like that. Everything I know about the methodology of cooperative learning I learnt from Johannes and his colleagues (Ronel Calitz).

The cooperative agreement reached between the OFSED and the CIE programme at the University of Pretoria represented a programmatic attempt at providing lateral or synchronic, systemic support to the CALIS Project in terms of the national context in which the implementation of the Project was to take place.

Regional systemic support occurred both diachronically, in the form of the preceding drive to ensure the computer literacy of educators in the Free State, and synchronically in the form of the FRETEEL and FRENET projects.
4.3.2.3 Regional

The programmatic planning involving the integration of computers into all aspects of school functioning began as far back as 1986, when Dr Venter’s predecessor, Berend Wessels, first formulated the idea that computers should be introduced into schools in a planned, systematic and evolutionary way.

(101) I know that the person who was my predecessor at the time, Berend Wessels, was actually a South African pioneer in terms of bringing the computer into teaching (Peet Venter).

On assuming office, Dr Venter took up the challenge and instituted a planned, incrementally evolutionary plan for the full integration of computers into schools. The received wisdom (essentially, communicated by Berend Wessels) at the time suggested that computers should initially be introduced into schools as administrative tools only. The idea was that principals would come to appreciate their value and cost-effectiveness in expediting school administration. In the process, principals would come to hold a favourable opinion of the value of computers in education in general. The following step would be the introduction of a programmed infusion of computer literacy skills amongst educators in the region. This was to serve as preparation for the implementation of the CALIS Project, which would finally establish the use of computers in classroom practice.

(102) I think it would be good if we documented these things in some way or other. I don’t know what your study encompasses – whether it involves writing down all of these things, or whether – I would like to see you focus not only on the CALIS Project but would like to see you focus on the FRENET Project and the administrative component as well. Because we never thought of CALIS as a separate project; we always saw it as an integrated approach involving the coming together of the three legs in influencing the school environment in its totality: to involve the administration, the teachers and the children in information technology – that was the overarching goal. There was never a project simply for the sake of a project - ... I think they were fairly
successful in preparing the way for the integration of computers into the classroom. Their philosophy was that they first wanted to establish the use of computers as administrative tools in schools. They felt that, if the school management experienced the value of computers in administration, the implementation of computers in classrooms would be approached more easily and enthusiastically (Peet Venter).

(103) Ok, the whole process started in 1986 when we began with two sides of the same thing – two aspects: one aspect was the training of teachers in the use of computers – in the use of word processors, spreadsheets and database applications. This was very elementary at the time (Johan Badenhorst).

(104) The second leg was the administrative side, where we initiated FRESAD [Orange Free State School Administration Database] training for principals and secretaries, or teachers involved in doing the work (Johan Badenhorst).

The following comments provide further evidence of the introduction of the school administration programme (FRESAD) prior to the introduction of CALIS.

(105) At that time computers were fairly well-established in white schools, but only in terms of administration. The FRESAD Programme was running successfully in many of the schools and the secretaries and management of schools (principals and deputy-principals) had also been fairly well-trained in the use of word processing (Peet Venter).

(106) The aim was to get principals to take cognisance of technology so that they could become involved, could realise the value of technology and could shake off the attitude that they were incapable of achieving anything (Johan Badenhorst).
(107) I know that there were secretaries who only used FRESAD for the generation of reports and that was all they used it for (Hercules Dreyer).

The introduction of the school administration programme seems to have been a success, as widespread use of the programme before the introduction of CALIS is reported in the narratives presented in this study.

The next phase in the process was the implementation of a programme that would seek to achieve widespread computer literacy amongst the educators in the Free State. Fortunately, as already mentioned, education centres had previously been established in certain towns across the Free State for the express purpose of offering Computer Science tuition to learners. These centres could now be used as educator training centres in terms of the delivery of computer literacy skills.

(108) What I do know is that there were established computer centres across the Free State at that time. The people at those computer centres presented Computer Science – teachers did not present the subject at that time (Igno van Niekerk).

(109) And then we said that one of the things that made us very strong in the Free State was a Project called the 'Computers in Teaching and Learning in Schools Project'. And you will remember – no, it was before your time – that many years ago all teachers received computer literacy training at these computer centres ... When we started this project [CALIS] 97% of teachers in the Free State had been trained and were computer literate – far more than in any other province (Hercules Dreyer).

(110) The idea at the time was that one should begin with word processing – at the time it was 'Framework'. My predecessor and his colleagues installed 'Framework' in as many schools as possible so that teachers could at least make use of word processing software in generating their own examination papers (Peet Venter).
At the time, something that was instituted together with the CALIS Project was ‘Framework’. ‘Framework’ was a word processing and spreadsheet package. We all went on ‘Framework’ courses – and I mean the whole staff was there. You were ‘Framework’-literate. I think I still have the certificate - and we could all type our own examination papers (Igno van Niekerk).

We also used to go to all the various centres inside and outside of Bloemfontein and do computer courses with teachers who came from satellite groups to one centre. And I taught them how to use a computer inside of a classroom, and what to do with children on a computer (Maureen Dale).

The implementation strategy in terms of integrating computers into education arose essentially from the perception that it embodied best practice at the time. There was, however, another reason for Dr Venter’s insistence on the veracity of the Project. Exhibiting the kind of thought and action characteristic of systems-thinking-in-action (Fullan, 2005), Dr Venter realized that the infrastructure created by way of the chosen implementation strategy, and more particularly the capacity created by the CALIS Project, would be invaluable in fostering sustainability during, and after, the inevitable amalgamation of different education departments in the Free State. Furthermore, the language in which this realisation is couched, suggests very strongly the implicit adoption of a viral or ecological (see Cavallo, 2004) approach to the sustainable growth of the Project.

Look, from 1991 we realised that it was a matter of time before we became one big department, and we honestly believed that the CALIS Project could establish skills and knowledge growth points across the province, in such a way that these growth points could feed schools in previously disadvantaged areas and could help them to integrate in this way (Peet Venter).
In terms of diachronic context, this is the system within which the CALIS Project was envisaged. But the diachronic context was enriched by a synchronic context that included the implementation of the FRENET and FRETEL programmes.

The FRENET (Free State Education Network) Project had as one of its objectives the stimulation of the kind of co-operative, sharing culture that had made such a lasting impression on Hercules Dreyer during his visit to the United States of America. The idea behind the Project was that the connection of the OFSED and individual schools to the Internet afforded not only a more effective and efficient medium of communication, but also the opportunity of sharing instructional and other educational resources.

(113) What happened simultaneously – and this is not widely known – was that there was a project geared towards using the Internet in enabling teachers to share lessons (Hercules Dreyer).

(114) In teaching, the most important thing, as you know, is matriculation exam results. So, if you had a really good idea about how to teach organic chemistry, or any other part of the syllabus, you kept it to yourself since it was your secret and you did not share it. That was rubbish! What I preached at the time was that teachers had to abandon that approach – they had to share things because you know what will happen: that great lesson of yours will be returned to you in three months time – in a greatly improved format. We had to start sharing – that was the whole idea (Hercules Dreyer).

(115) This network that we wanted to launch – this whole FRENET thing – I don’t know whether you have heard of it: the Free State Education Network. That was the idea: to get these things networked so that we could start exchanging things. That was our vision at the time – 1993! Do you know how long ago that was? (Hercules Dreyer).

(116) Dr Peet Venter attempted to get the whole thing going from the 21st floor of the C.R. Swart Building, using modems,
so that teachers could communicate via modems and e-mail and things like that (Ignor van Niekerk).

The establishment and implementation of the FRENET Project was thus far more than the creation of a networked environment in which effective communication could thrive and sharing of materials could take place. It was, in fact, an attempt at changing the systemic context (Fullan, 2005) in which learning and teaching were to take place. Although the FRENET Project, as such, was effectively halted by the withdrawal of official government support, the evolution of the larger systemic triad (CALIS, FRENET and FRETEL) into a viable, sustainable programme continued to exist at the time, and exists today in a myriad of different guises.

The FRETEL Project came into existence as a result of an opportunity offered to the OFSED at the time. Absa Bank had installed a satellite-based television training initiative that was to be employed by the Bank across the country. There were, however, times when the network was not in use and departments of education across the country were offered the use of the network for educational purposes. The cost involved was negligible. Here, then, contributing to the sustainability of the larger triadic Project, was the first instance of a private concern investing seriously in the proposed technology-in-education initiative (Fullan, 2005).

(117) And, together with CALIS in schools, we had another project – I don’t know whether Hercules told you about it – the television. Absa came to see us in 1990/1991 – I think it was someone called Claassen from their head office. I think he approached all the departments in the country and told them about the private Absa network that had been established in order to broadcast to all Absa banks. Every morning between a quarter-to-eight and eight, the CEO would address all personnel and so forth. They used it for training but there were times when the network was idle and we were offered the opportunity of using the network – virtually for free! (Peet Venter).

(118) They sold it to a number of companies and they spoke to departments of education. They also spoke to Peet who was at the launch in Bloemfontein. He called me and said that that was something new just for us. And we then started
looking at what we could do and how we could best use this thing. We then entered into an agreement with them, whereby we were given an hour per week at very good rates indeed. We then started preparing lessons. That was my job (Hercules Dreyer).

(119) I went to a computer centre and Hercules Dreyer and I started looking at FRETEL. We made the first recordings after having come up to speed on video technology. This was an initiative that had been undertaken in collaboration with Absa. Absa took over the old SABC studio in Johannesburg (Igno van Niekerk).

The OFSED was the only department of education in the country to take up the offer. Dr Venter, immediately aware of the potential value of satellite-based training and communication, accepted the offer gratefully. He reasoned that it would be possible to establish two reception centres in each of the 50 municipal districts across the Free State. In this way, no school would be further than 50 kilometres from a reception centre. Educator training initiatives could then be conducted more efficiently and cost-effectively.

(120) Our ideal was to establish one or two points in each of the 50 magisterial districts in the Free State to which we could broadcast, via Absa. We plotted the distances on a map and saw that no school would be further than 50 km from such a reception point. Then, instead of the training they do nowadays where guys from all over are put up in grand hotels (they spend millions of rands on the dissemination of knowledge now), they could make use of that network (Peet Venter).

(121) But you can have LF’s [learning facilitators’] offices at the seventy points and if you then want to train or make known a new policy, like OBE [outcomes based education] then you first train these guys centrally, face-to-face and you then tell them that further training will take place via broadcast, and you explain exactly how that will work. You
then explain to them how they have to facilitate courses at each of the seventy centres (Peet Venter).

Dr Venter also envisioned a further use of the satellite-based television network in terms of the communication of management information. The efficacy of the traditional means of communicating from the OFSED to schools across the region was in serious question at the time. Not only was there a sizeable time lag between the issuing of the communication by the Department and the reception of such communication by the individual institution, but the message itself was often corrupted along the way. How much more complex and difficult would the situation be in the new dispensation where the Department would have to communicate with 2000 schools, rather than 200? Dr Venter realized that the network presented a unique opportunity in terms of creating communication channels for the fast, accurate dissemination of management information.

A television studio was duly equipped in a suitable venue at the Teachers’ Centre in Bloemfontein. There television broadcasts were recorded and the tapes couriered to Johannesburg (Absa had purchased the old SABC studios in Commissioner Street) and the programmes were then broadcast to schools across the Free State region.

(122) My experience at the time was that it was an ideal set-up with brilliant people who were told exactly what to do. When they have to implement, however, it is something completely different that is implemented. There was a distortion of the message as it was communicated down the hierarchy. And, besides that, you could talk to people once, twice, three times every day of the week. The managers could talk to all the principals in the province at three o’clock of an afternoon and explain to them: we have the following problem and you need to approach it in the following way – not in this or that way. And it was interactive – they could ask him questions while he was on air and he could answer them. It was an incredible management tool and it would have saved them many rands while they could have implemented more effectively. We had it – the satellite dishes were in place and the first broadcasts had already taken place (Peet Venter).
(123) Behind where Brebner Primary is today we had a studio with good equipment that had been donated to us by Absa. Then Gert Heyns, for instance, would arrive and we would make a recording. We would then courier the tape to Johannesburg and it would be broadcast the next morning. Or, as often happened, they would organise it themselves. They were more often in Pretoria than here. They could then simply go to the studio and initiate a live transmission aimed at principals, or learning facilitators, or teachers or curriculum managers (Clinton D’Oliviera and his colleagues). They could then sit and answer questions live, for example, a lack of certainty concerning OBE documentation, and then they could talk about it, you know (Peet Venter).

The satellite-based television network was soon harnessed to enable the delivery of a more sophisticated, though predictable, service, namely instructional and educational programmes. Once again, as had been the case with the FRENET Project, an opportunity was identified for educators across the region to be exposed to material of the highest quality.

(124) I am going to tell you about that now: did you know that we built a whole studio at the teachers’ centre that enabled us to broadcast to points no further than 30km from individual teachers? Later we installed televisions and satellite dishes- at that time there was no such thing as satellite. The thing grew so fast that it no longer involved only computer-integrated education in schools, but also involved showing in a studio how to present individual lessons. They could broadcast these lessons to teachers and ask them to implement the lessons the following week (Hercules Dreyer).

(125) Let me tell you a little about where FRETEL originated – it was Free State Educational Television - ...(Hercules Dreyer).
We visited schools and we saw how teachers did certain things. In Welkom there was a new way of teaching children how to read and write. It was called ‘embodied experience’. They took the children outside and they then placed sticks and hoopla hoops on the ground in the shape of a letter, for instance a ‘b’. the children were then required to walk over the outline of the letter, exactly as it would be written. In this way they experienced the creation of the letter with their whole bodies. We had to come up to Johannesburg, for example in 1996 – the year before I left, where we got the examiners of matric papers to speak to all the Physics teachers or all the Maths teachers about the previous year’s paper. They were told where problems were experienced and what teachers had to beware of for the following year’s paper. They could speak to all the teachers simultaneously – where else is that possible? And those centres had been opened across the Free State (Hercules Dreyer).

The dream that Dr Venter had was that one would be able to broadcast to schools – that was the ideal. Absa would have sponsored it. I think, and I speak under correction, but I think Absa would have sponsored 52 black schools as far as the installation of equipment in schools in the location was concerned. Plus, Dr Venter’s idea was that some of them would have been able to take part in the specific educational situations by being granted access to Absa branches (Ignovan Niekerk).

This was the immediate context within which the CALIS Project was situated. The Project had never been intended to function in isolation but had been intended to operate as an integral part of a systemically larger triad of interrelated projects.

So, together with CALIS, FRENET and FRETEL, we believed that we were correctly positioned in the Free State to get teachers computer literate and improve the standard of teaching tremendously within a period of five years. Also, we
felt that the gap that had opened up as a result of Bantu
Education should be closed as quickly as possible. I believe
that we were in the starting blocks and ready to implement
(Hercules Dreyer).

The approach thus adopted was seen as the best vehicle for the delivery of computer-integrated classroom practice. This triad, in turn, was situated within the larger systemic network of diachronic and synchronic influences that impacted directly upon the CALIS Project. In this sense, an analysis of the CALIS Project in isolation cannot claim to do full justice to the kind of complex causality that characterises the system as a whole.

4.3.2.4 Project

The narratives produced by participants in this study indicate that the primary objective of the CALIS Project was the full integration of computers into classroom practice across the Free State region. Such integration was always to take place subject to the principle that technology, as such, was not the primary objective. The computer was to be used as yet another tool in the quest for the most effective teaching-and-learning strategy, given the specific contexts of schools in the region. As an enabler and as a lever for educational and instructional change, the computer was going to be a means to an end. This integration was also to be achieved in the most efficient and cost-effective way possible.

(129) Now, those were the first phases of this thing – the
next phase was where we started taking computers into the
classrooms. We move away from the phase focusing on
getting teachers computer literate and we worked towards
using the computer in the classroom. And that was where
CALIS came into being – you know that was the project that
targeted the use of the computer in the classroom. We were
going to use it as a tool, a resource in the class. The idea
was never that it should replace the teacher but rather that it
should help the teacher (Johan Badenhorst).

(130) The second facet was that, together with the computer
as resource, we addressed computer literacy - but that was a
bonus – it was not the primary objective. So, our primary
The goal was not to teach the child to use a word processor, but rather to teach the child Afrikaans, or Geography, or whatever, and then, as the need arose, teach him the computer skills required in the process (Johan Badenhorst).

(131) And the plan was to involve the child, in the end. That was why we began with the teachers and the administration, and ended with the child (Johan Badenhorst).

(132) What I learnt was important - and now I speak of that which I remember - was that I never saw the forms that they saw, but their goal was to teach us that you could use computers as resources in the class (Igno van Niekerk).

(133) And the mind shift that they made us undergo was that you could let a class of forty English children chat in a group (Igno van Niekerk).

(134) And I think the mind shift, after CALIS, was that the important thing was not the syllabus. All of these things were tools that became part of the syllabus, and that was the point of departure (Igno van Niekerk).

(135) I think, even today, any project that wants to succeed should still have the same goal, because, if the goal is simply technology for the sake of technology, then it will become a white elephant after a year or two (Johan Badenhorst).

A secondary objective, seen as a concomitant outcome inextricably linked to achieving the primary goal, was universal computer literacy amongst educators and learners in the region.

(136) The whole idea behind the planning was that we would have the same level of computer literacy amongst all teachers in the Free State as soon as possible - that was what we wanted (Hercules Dreyer).
(137) You have to aim at computer literacy and, once you have that, the other things can become add-ons. But I think that you have to use the computer as a tool (Sarie du Plessis).

A further secondary objective was perceived to be the fact those learners were being prepared for a post-school world of work where computers would be all-pervasive.

(138) Between Typing and English and Afrikaans, and that kind of thing, the vision was that we would be prepared for the market and the world of work (Igno van Niekerk).

Given the objectives of the CALIS Project, the initial response to the challenge of integrating computers into classroom practice was to ensure that implementation was grounded in the best possible theoretical framework. Recognising the dearth of expertise in the OFSED at the time, Dr Venter established that the necessary expertise did exist in the country. Subsequently, the decision was made to seek the assistance of those involved in the CIE (Computer-integrated Education) Programme at the University of Pretoria.

(139) And, together with Mr Hercules Dreyer, we held a first planning session and we felt that we knew too little to really implement the thing [computers] in the teaching-and-learning situation (Peet Venter).

(140) And then we did a bit of research and we realised that Johannes Cronje and his colleagues at Tukkies (University of Pretoria) were by far the leaders in this field at university level in the country (Peet Venter).

(141) So we drove up [to Pretoria] one day and saw them, and asked them whether they would want to enter into some kind of partnership with us – with our little team in the Free State. They could advise us and conduct research here; they could use their students to do the work here and, in this way, we could gain knowledge from them. They were anxious to help, and kind, and we formed a wonderful group (Peet Venter).
On the basis of the insights gained in this way, and on the basis of insights gained during the visit to schools in the United States of America, a strategy emerged. The five district-level education centres, originally established to enable the tuition of Computer Science as subject, were to be equipped with computer laboratories. In addition, a district facilitator was appointed in each of these centres in order to propagate and support the implementation of the proposed model to be used by individual institutions.

(142) From departmental side we encouraged them by way of the five centres and our five coordinators. Plus, Hercules Dreyer used the knowledge they had gained from Johannes Cronje and his colleagues to further the dissemination of knowledge in these areas, and to help people to conduct their business (Peet Venter).

As indicated previously, institutions were invited to apply to be included in the Project. There were certain criteria (no participant has access the full list anymore) that had to be met by participating institutions, one of which is almost certainly to have been the nature of educator capacity in terms of computer literacy.

(143) You know, my husband was very involved in FRESAD at that time, so he supported FRESAD strongly at the school and in the region as a whole, and, as a result of his involvement and the fact that Johan Badenhorst worked with Peet Venter at the time, Johan Badenhorst said that it would be a good school in which to launch the Project since there was someone who knew something about computers. I think we were identified as a school that could implement the Project successfully on these grounds. Also, we were a very small school – 300 / 350 children in Grades 1 to 12 – so twenty computers would be enough for so few learners (Sarie du Plessis).

The fact of the matter was that a great deal of thought and planning had gone into the selection of specific schools as participants in the Project, not least of all from the point of
view of the impending amalgamation of the various departments of education in the region. The implementation of the Project was to ensure the establishment of growth points across the region. These growth points would foster viral or ecological expansion that would ensure the sustainability of the enterprise, to the benefit of all departmental schools in the new dispensation.

(144) But schools were chosen on the basis of their distance from each other since they were to act as growth points for the cluster kind of approach. Our idea was that there had to be clusters- and schools that received computers from us did so on the specific condition that they were to involve other teachers in the vicinity so that these teachers would be stimulated and the multiplication effect would be achieved. And, you know, that is what happened at schools. But the fact of the matter was clusters – Hercules had a computer graphic which illustrated the effectiveness of this multiplication. (Peet Venter).

(145) The decision as to which schools we should choose: in the past it often happened that we said we would take the big schools first because they had the money anyway. But we looked at the situation and realised that the new South Africa was upon us and we knew that circumstances would change and that we would become one department of education. Part of the CALIS Project, besides establishing centres in schools to get the teaching and learning going, we had to plan centres in such a way that, when we inherited the black teachers, they would be close to such centres so that the Project could continue and teachers could be trained and made computer literate. And that was why there were centres such as Tweeling, Kestell, Warden, and I think Memel and Vrede – widely spread across the Free State. We wanted to ensure that guys at farm schools were also within easy reach of a centre. The idea was that we would have all teachers computer literate within five years of the establishment of the new department of education (Hercules Dreyer).
What is clear is that schools were given very specific instructions as to the way in which computers were to be integrated into the curriculum.

Firstly, it was stated unambiguously that the computer hardware and software donated by the Department (the exact nature of this arrangement will be discussed under the section dealing with physical influences) was to be used solely for academic purposes and not for school administration.

(146) The only condition was that the hardware could not be used for administration – it had to be used for teaching and learning by the learners. We also checked up in order to ensure that the stuff was being used for that purpose (Peet Venter)

Secondly, the understanding was that educators who decided to become involved in the Project would be tasked with the responsibility of training other educators at the same institution in terms of computer literacy and the integration of computers into the curriculum.

(147) We also had to train the teachers. That was also one of the conditions: teachers had to be trained during the afternoons in order to make them competent in the use of the computer – and competent in the use of the various things [applications] (Sarie du Plessis).

The learning-and-teaching approach favoured by the departmental Project team seems to have been informed by two broad approaches. The first approach valued cooperative, resource-based constructivist learning above the traditional instructivist approach in general usage at the time. The second broad approach, in contrast to the narrow cognitive, academic focus found in schools at the time, emphasized the development of a wide range of skills including cognitive, emotional, connative and sensori-motor skills.

(148) We adopted, to a large extent, the model of cooperative learning and this model found expression in our classroom practice. The first implementations we did took place in a class of thirty children, for example, with the idea that eight or ten computers provided access to a third of the class, while a third were kept busy by the teacher and a third
were involved in practical work or an assignment or something (Johan Badenhorst).

(149) We then visited schools and we saw how teachers did certain things. In Welkom there was a new approach to teaching children to read that was called ‘embodied experience’. They took the children outside. They then took sticks and hoopla hoops and arranged them on the ground in the shape of various letters, for example a ‘b’. Then the child would have to walk over the outline of the letter, in the same manner as it would be written. In that way the child experienced the idea outside in an embodied fashion (Hercules Dreyer).

These approaches found expression in particular practices relating to the integration of computers into classroom practice at individual institutions. Schools at which the Project was implemented were supplied with a number of computers. Narrative reports differ in terms of the exact number of computers supplied to each school. The instruction given to schools was that enough computers were to be installed in the classroom of a participating educator to ensure that a third of the class could work on the computers concurrently. The rationale for this decision, as opposed to placing all of the computers in a computer laboratory, is explained by Hercules Dreyer:

(150) What we tried to move away from was the typical computer laboratory … - I drove around in the Free State to see what schools were doing with their computer laboratories. It looks fantastic; there you have thirty computers, but spend a little time there and you soon see what they do: you will notice that they have little programmes like Mathematics revision programmes or pictures and the like. Then the children sit and practice thousands of Mathematics problems and the teacher simply sits and watches – so that was the ideal opportunity for the teacher to catch up on some marking, since he has the laboratory period in which to do it. So, he would chase the children into the laboratory and whether they practiced anything or learnt anything was all the same to him. At least
he would be able to mark his books and the children would be involved in revision (Hercules Dreyer).

The educators were also given very specific instructions as to how these computers were to be utilised. At the time, the class size in most schools controlled by the Department was in the region of 25 to 30 learners. Educators were advised to divide the class into three groups. Each group would be engaged in a different activity. One of the groups in the class would be engaged in working on the computers while another might be interacting with printed resources and the third might be engaged in interaction with the educator. It is not difficult to espy in this particular organisation of the learning experience the influence of the group work-based, problem-centred approach to Mathematics that had been implemented at the learning enrichment centre in Bloemfontein by Dr Venter before he had been appointed head of the computer section of the Department.

(151) You divided up your class and a group would work on the computers, a group would work on their own and a group would be involved with the teacher. The children on the computers had to be involved in doing something stimulating, not silly little exercises. The children really had to do something different. And that was our model (Hercules Dreyer).

(152) The first schools in which we implemented the Project consisted of classes of thirty children, for example, and the idea was that eight or ten computers would give access to a third of the class, while a third were involved with the teacher and a third were busy with practicals or an assignment or something (Johan Badenhorst).

Although the instructions given to the schools might, at a first glance, seem draconian, educators were in fact encouraged to be flexible in their usage of the computers – given the understanding that such usage should take place within the spirit of the learning-and-teaching approach outlined above.

(153) The idea was also – it could also happen – that children used the computers individually, particularly in the
situation where the class was divided into two groups that were busy with different activities. It all depended on the circumstances, and it was much easier in situations where there were fewer than eight computers available (Johan Badenhorst).

The fact that the broad learning-and-teaching strategy outlined above represented a radical departure from the established practice at schools in the region, meant that the development of new learning materials would have to be developed and disseminated in the most efficient and cost-effective manner. The FRENEN Project was seen as providing a solution to this problem. Not only would educators be able to create and exchange learning materials, but they would also be able to communicate regularly with each other, and, in that way, counteract the debilitating sense of isolation imposed by the dispersed nature of their physical situation. The kind of cooperation and collaboration envisaged by Hercules Dreyer included the establishment of working groups that could address the development of learning materials in a structured manner.

(154) The idea was that, as you studied, you created Internet-based groups so that guys could begin to exchange lessons – such that you could say to a guy: you prepare that particular part of the syllabus (Hercules Dreyer).

Such cooperation and collaboration was, however, not merely to be structured in terms of content. The idea was that the material developed in this way would be developed by specialist, talented educators who would be able to produce learning materials of the highest quality for dissemination to all institutions in the region.

(155) You have to update every year – ‘but we don’t have the time to update’ – So I say, let’s have a look at the guy who was the best teacher last year, and let’s ask him to update the first three months’ work – and let’s use that teacher who is an expert on this piece of work. This guy is a brilliant literature teacher and the children are mesmerised in his class. Let’s ask him to update the second term’s work. This guy does that, and we all share everything – and we thank this guy and we pay him for the work he has done. You prepared those lessons, and, instead of buying new textbooks
worth 15 million Rand, we thank you, we disseminate these lessons via CD ROM and we pay you five thousand Rand for your trouble. The printing of the CD ROMs costs R20 000 and next year everyone teaches the way you did – they have the video clips of you presenting your lesson (Hercules Dreyer).

Furthermore, such development (traditionally conducted at Grade 12 level) was to take place at primary school level and to be introduced gradually at higher grade levels. The reason for this decision is provided, once again, by Hercules Dreyer.

(156) We only do Standard Two this year and we work hard and ensure that we get the best lessons for Grade Fours. Next year we do Grade Five and the following year Grade Six - because it doesn’t help to spend millions of Rands on helping matrics. We begin with the Standard Twos, the Grade Fours. If you begin with Grade Four Mathematics and Science – in fact, all the subjects – and you train teachers properly, imagine what potential this thing would have (Hercules Dreyer).

What kind of learning-and-teaching strategy, advocated by the managers of the Project, could have been so revolutionary and innovative that it demanded the development of completely new learning materials? As mentioned above, the educational philosophy underpinning the teaching-and-learning strategy at the time was essentially instructivist. The implicit supposition informing this view is the concept of the educator as source of all knowledge and the view of the learner as passive receptacle into which such knowledge is to be poured. The educational philosophy underpinning the CALIS Project was radically different in that learners took centre stage as the active creators of knowledge. The role of the educator was to change from source of all knowledge to that of facilitator and guide.

(157) One of the things we always preached was that, in the past, we thought that you had so much knowledge and you had to impart some of it to the learners – that was what we were taught. I know everything about Mathematics that you need to know and I will teach it to you. But the computer and the Internet suddenly opened up a whole new world for the
children with which you were unable to keep up. You can’t possibly keep up with everything, and I told teachers at the time that they are only facilitators in the classroom.

Facilitate the learning process – but create the freedom for the learner to read and progress. Allow the child to surpass you in knowledge. If he knows more than you do, great! That’s wonderful! I spoke to teachers at the time and told them that the computer would not replace them – it was like an overhead projector. An overhead projector can’t do things for you – you simply use it as resource. Instead of writing everything on the blackboard, and wasting a lot of time in the process, you can prepare things beforehand. In the same way, the computer enables you to do certain things. Computers can even do things for you while you are not present, but you still have to prepare. You have a role to play in the process, and that was the crux of the matter (Hercules Dreyer).

This change in role, and the attendant removal from a position of power in terms of knowledge, must have unsettled many educators who perceived therein an erosion of their authority and a threat to discipline. Coupled to this disturbing development was the introduction of computers as active aids in classroom practice. Many educators were only too conscious of the fact that, not only were they themselves computer illiterate, but some of the learners in their classes were likely to be completely at ease in their interactions with the computer. It was these fears, amongst others that Hercules Dreyer had to address on his visits to the various districts and schools across the region.

(158) You soon identify the bright spark in the class. Tell him: It is your job to see that the software is loaded – you have to get things going. The bright child then takes over. So, that was one of the mind shifts that we had to engineer. I remember how I sat at the teachers’ centre with a host of teachers in front of me and very time I would come back to this picture: just give the guy the opportunity – don’t worry about the fact that they know more than you do (Hercules Dreyer).
From the inception of the Project, both Dr Peet Venter and Hercules Dreyer were adamant that educators had to be provided with as much active support and motivation from Departmental representatives as was humanly possible.

What was the experience of educators in terms of the extent and quality of the Departmental support on offer?

On the one hand, Igno van Niekerk believes that his involvement in the Project was a direct result of an inspiring visit to the school at which he taught, undertaken by Hercules Dreyer.

(159) Initially, I was very busy and as these things sometimes happen, I would not have been involved in the CALIS Project had it not been for the fact that Hercules arrived at the school one day and said that he had come to see what I was doing. So it was really a matter of their going out to teachers with the Project and tasking specific teachers with involvement (Igno van Niekerk).

On the other hand, the experience of Sarie du Plessis was that, after the initial implementation of the Project, she was largely left to her own devices.

(160) Then Hercules Dreyer began CALIS – computer-assisted learning. But, at the time, they really didn’t visit us very often. There isn’t much – you were left to your own devices. There wasn’t a syllabus and you had to take the initiative. You could pretty much do what you wanted to do (Sarie du Plessis).

On the part of Dr Peet Venter and Hercules Dreyer, the visits to districts and schools, though perceived to be essential in terms of ensuring sustainability of the Project, were not enough. There had to be another way of inspiring and motivating educators by exposing them to excellent examples of computer-integrated lessons and the latest offerings in terms of hardware and educational software. It was Hercules Dreyer’s vivid memory of attending the National Computing Conference in the United States of America that first sparked the idea of a regional expo.
With that which I had seen in America [the computer conference], I had the idea to get things started in South Africa. And what we did was to advertise it throughout the Free State and we presented it at the teachers’ centre, where we had a number of keynote speakers. Renate gave a talk and a couple of other guys, and her students, of whom Johannes was one. Her students had to present lessons in classrooms that were subject-specific and, in that way, you had the languages following one stream and the science subjects another. So teachers went along to these classrooms to see what these guys did with computers in the classroom. It was that that planted the seed (Hercules Dreyer).

At the time, the CALIS-related exhibition exposed us to things like programmes that were syllabus-driven (Igno van Niekerk).

Once again, the assistance of the people involved in the CIE (Computer-integrated Education) Programme at the University of Pretoria proved invaluable.

One of the methods we used was to present expos where some of Johannes’s students – postgraduate students who were teachers – presented demonstration lessons in order to show teachers how computers could be implemented in the classroom (Peet Venter).

Besides invitations sent out to practitioners in the field of computer-integrated education, private firms in the business of selling computer hardware and educational software were approached to exhibit their goods at the expo, with the result that systemic networking took place across the boundaries that traditionally separated public educational institutions and private business concerns.

Our teachers who attended the expos, besides all the hardware, software and programmes that they saw there, - we involved firms in the field - ... (Peet Venter).
The success of the first expo as an inspirational and motivational tool is evident in the comments made by some of the participants in the study. The influence of the expo on the educators who attended seems to have been profound.

*(165) They organised a CALIS week where they then demonstrated best practices and I experienced that as very supportive because you could see what other teachers were doing (Sarie du Plessis).*

*(166) But the big thing that we really wanted with the demonstration lessons was for teachers to experience the opening up of a whole new world for them. And that ignited the fire, and guys started implementing things in the schools (Peet Venter).*

After the first expo had run its course, it was immediately apparent that it should become an annual event. Hercules Dreyer was given full responsibility for the organisation of the second expo which took place a year later. Dr Venter had worked with Maureen Dale at the Education Centre in Bloemfontein when both had been involved in enrichment education. He was well aware of her enthusiasm for computers and her organisational abilities. Maureen was thus approached to host the second expo at Eunice Primary School.

The second expo was, however, not to be an exact copy of the first. A number of educators in the region had enrolled in the CIE Programme at the University of Pretoria, after having been introduced to their work at the previous expo. Such educators had thus gained expertise that would enable them to present computer-integrated lessons at the second expo. In order to entice them to do so, a competition for the best computer-integrated lesson was launched and the presentation of the best lessons, as well as the prize giving ceremony would take place during the second expo. Hercules Dreyer went to great lengths to ensure that the prizes on offer would attract the best teachers in the region.

*(167) And we repeated the expo the following year and Hercules was the organiser of that expo – it was really an unbelievable catalyst that released the energy ... (Peet Venter).*
What we did the second time was we decided that we were not going to get other guys to present the lessons as we had done during the first expo. We said to teachers, right, the next expo will be at Eunice and there is a competition where teachers will be presenting lessons themselves. You are going to show us what you have learnt from Johannes and his colleagues – there were a number of guys who had registered for courses like the M.Ed. and B.Ed. at the University of Pretoria, and they were well on their way. They were going to prepare the lessons. And Peet and I decided that we were going to give big prizes for the best lessons. The third prize would be a laser printer, the second prize a laser printer and a top-of-the-range computer, and the first prize would be a trip overseas to one of the big computer conferences, like the National Computing Conference – one of the big overseas conferences involving computer-teaching (Hercules Dreyer).

I also, at the same time, sent out the documentation and said, ok, if you write a programme, submit it- and it had to be of educational value - and we would then assess the programme and you could win ‘one of the following’. So there was something for them there as well and we used to sometimes get up to 80 – 120 people who actually sent in their programmes (Maureen Dale).

The competition for the best computer-integrated lesson conducted during the course of the second expo affected two of the participants in this study directly. Ronel Calitz was adjudicated to have won first prize and Igno van Niekerk was placed second. The first prize in the competition was an all-expenses paid trip to the World Conference on Computers in Education, to be hosted in Birmingham (1995). Unfortunately, Ronel was unable to undertake the journey and it was decided that Igno would attend the Conference instead. The full extent of the exposure that the CALIS Project would get on the international stage was unlikely to have been foreseen by those involved in the Project.

What I did experience was that there was a nice competition at the second one, and the aim was to get
teachers involved. So, where the first one focused on training teachers, the second one was more a matter of involvement (Igno van Niekerk).

(170) I also made a presentation there and I won second prize, which was a computer. I also had the wonderful privilege – and I am eternally grateful for this – that Ronel Calitz was unable to use her first prize – a trip overseas (Igno van Niekerk).

(171) They held the main event, with keynote speakers, at the end and that was where they conducted interviews with us. And, suddenly, the CALIS Project from Bloemfontein appeared on the international stage and the teachers from South Africa were applauded – those who were involved in this Project (Igno van Niekerk).

Igno was, however, clearly made to understand that he was attending the Conference not only for the purposes of self-enrichment but also because he would be expected to re-invest that which he had learnt in the region, district and institution in which he functioned.

(172) So it happened that a guy from CALIS ended up in Birmingham in England and it was an unbelievable privilege. But it also brought down incredible responsibility upon one, because one of the prerequisites was that one had to return and plough back what one had learnt - and, I think, even Johannes Cronje encouraged us to plough back what we had learnt. And so it happened that I ended up at Dr Peet Venter, Hercules and FRETEL. We ploughed back what we had learnt into FRETEL, and sent out the information into the world (Igno van Niekerk).

The competition was extremely effective and played a significant role in ensuring that the expos popularity grew from year to year, in this way stimulating interest in, and ensuring the sustainability of, the integration of computers into classroom practice.
As already mentioned, Dr Venter’s perception, expressed in a speech he delivered at the last expo, was that the CALIS Project had entrenched the integration of computers into classroom practice to such an extent that, when official Departmental support was finally withdrawn, the practice had taken on a life of its own in the midst of contextual and systemic support that would ensure its sustainability. These sentiments are supported by comments made by other participants in the study.

(173) Once again, CALIS produced value far beyond the weekend on which it happened, since a school was able to enter into an agreement with a private company five, six, eight years later. But Brebner also invested a lot in those computers (Ignou van Niekerk).

(174) CALIS ensured that an ordinary school could have a centre, and the principal was given the responsibility of upgrading it (Ignou van Niekerk).

(175) There are definitely schools that have continued with the Project to the present day. As to why they have done this, it was not for the sake of the Project as such, or simply because the money was available. The Project was not only feasible, but it also had meat about it. The Project was not launched for the sake of technology, but for the sake of the child in its totality (Johan Badenhorst).

(176) Yes, and, as a result of that issue, it can be one of the biggest frustrations because the governing body and the parents had to fork out a lot of money and now it has to be implemented. The Project was so successful at schools in which it had been implemented that a number of schools contacted me – Merriespruit, for instance, invited me to tell them what they were supposed to do with their computer centre. I told them that the solution was very simple: they had to take the thirty computers, place them in three classrooms, and break down the computer centre (Hercules Dreyer).
Ok, you asked the question whether there were school teachers who continued to use computers after support – yes, I think there definitely were schools. I think schools began relying far more heavily on their own initiatives and they started training teachers, individually, and, in the end, there were very meaningful programmes (Sarie du Plessis).

4.3.2.5 District

The strength of the regional and project-based initiative was such the regional head office was inextricably linked to the district centres and the schools themselves. For this reason it is very difficult to identify a programmatic district initiative that was not also a regional programmatic initiative.

4.3.2.6 Institution

Even though very clear guidelines for the implementation of the CALIS Project, regarding the integration of computers into classroom practice, were communicated to participating schools, the implementation of the Project at individual schools was often conducted in ways which recognised the unique contextual and systemic situation of each institution. In this way, the generically-defined guidelines were concretised in a context-sensitive manner. This had a marked influence on the evolution and sustainable use of computers as part of classroom practice.

The principal, as chief operating officer of the school, played a major role in interpreting the proposed guidelines in ways that could be implemented effectively within the particular context in which the institution was situated.

Now can I add something there – in 1994 I put 5 computers into each senior primary class and the whole project failed dismally. Do you know why? The teachers weren’t computer literate. What I did was, after 2 years, they gave it up. I took them out of the classrooms and I put them into a computer lab and then I gave the staff in-service training and, from me, they graduated to better and better skills and one or two were motivated enough to go off and have courses elsewhere,
and I’ve never put them back into the classroom. I kept them in the computer lab and the people have upgraded their skills phenomenally and they’re using them. It’s wonderful – but it was an absolute, absolute failure – now the same teachers are coming back to me, after ten years, and saying to me I must have been ahead of the times – saying to me now “Please can I have computers in my class”. They are completely, completely literate (Maureen Dale).

But the principal alone could not ensure the institutional sustainability of the Project. As indicated in the extract from Maureen Dale’s narrative, the educators at individual institutions had to be motivated to buy into the Project, initially, and to ensure the sustainability of the Project over the medium to long term.

Furthermore, support from school governing bodies played a crucial role in ensuring the financial sustainability of the Project in terms of the upkeep of physical resources and the appointment of personnel. Such support would have found expression in a planned, programmatic approach to the integration of computers into classroom practice.

(178) Now, some of these centres still exist at schools – there are many of them that eventually appointed teachers to keep the thing going (Johan Badenhorst).

(179) I was in their facility at the time. It was a very beautiful facility and was a product of the Project. And that was essentially own initiative and not something that the Department provided – and it was taken up in the high school as well and found expression in things like Computyping and that kind of thing (Johan Badenhorst).

The involvement of school governing bodies, in terms of financial sustainability, though crucial in ensuring parent support for the Project, was often not enough. The result was that institutions had to find innovative, and often creative, ways of either raising funds or cutting down on costs.

One of the initiatives, mentioned below, involved the establishment of an Internet Café (run entirely by learners) in the school computer centre. Another initiative involved the
establishment of a printing press at Eunice Primary School where learning materials, in support of the CALIS Project, were to be printed.

But no, my people here: we opened our own printing press – we had got to that stage – being able to produce learning material (Maureen Dale).

Programmes initiated by individual institutions thus tended to address the financial sustainability of the Project. Although governing bodies, principals and educators played a central role in contributing to such sustainability, their contribution was supplemented by support from the wider systemic network in which they were situated, as will be discussed in the section on systemic influences, below.

4.3.2.7 Educator

Although financial sustainability was crucial to the success of the Project, it was clear from the beginning that the Project would stand or fall on the strength of its ability to deliver a learning-and-teaching strategy that paid educational dividends in the classroom. In this regard, the educator implementer had to fulfil a vital role. Once again, regional, district and institutional guidelines had to be interpreted in such a way that the unique situation of a particular classroom inhabited by particular learners could be addressed effectively.

An example of an educator-initiated programme designed to address specific needs in the classroom, and the wider institutional and systemic context, was that designed by Ronel Calitz. The school at which she was the organizer of the Foundation Phase, Taibos Primary, attracted learners from a socio-economically disadvantaged community. A fairly high rate of unemployment, poverty and poor family environments characterised the community. Furthermore, many of the learners attending the school experienced learning impediments. Given this context, the implementation of the Project in her classroom included unique features, such as the use of mothers as monitors who would be assigned to each of the three groups in each classroom. These mothers were often parents who could not afford school fees and who were then given the opportunity to give of their time. The upholding of their dignity and self-respect was also supplemented by the acquisition of computer skills that could stand them in good stead in the world of work.
You know, something that was very interesting was the fact that we got parents – I was at a school that served a disadvantaged society: there was terrible unemployment etc., and parents were unable to pay school fees. You know, people like that counted out the school fees. So we approached some of those parents and asked them whether they would be prepared to help at the school. They were placed at the work stations and asked to monitor the little ones – it was very cute, and they did fantastic work. We provided them with basic training in how to treat the children. We also held weekly meetings with them to discuss problems that they experienced in their classrooms. In the beginning the teachers also found it strange to have parents in the classes with them – but that was a project within a project (Ronel Calitz).

The reaction of the mothers involved in the implementation described above seems to have been very positive. Soon more mothers became involved and all Foundation Phase classes were able to enjoy parent monitoring. One of the mothers involved in the Project claims that her involvement had a profound effect not only on the kind of learning that took place, but also on her own well-being.

Anna: Ok, there were different groups - one was Mathematics and the other was languages. Let us say that one of the groups went to Ronel for Afrikaans. They would also go to the computers and learn about them. You would then have one group in the corner and they would physically read from a book for you. The other group – we were always two moms – went onto the computers. Then we would show them how the thing worked – how you switch it on. Oh, the kids loved it! We basically monitored their activities and awarded marks – we couldn’t save everything since they were old computers with small brains, so we had to write down the kids’ progress…

It gave back my dignity to me. Ok, you don’t know my past, but it made me human again and, I tell you, my self-image improved very, very much – and, with the computer courses
behind me, I can almost say that I am top of the world (Anna: Ronel Calitz).

So, the way in which regional, district and institutional guidelines were interpreted by individual educators found expression in very specific programmatic offerings in individual classrooms.

Such offerings also encompassed, however, the kind of cooperative, social constructivist approach to learning and teaching that Dr Peet Venter and Hercules Dreyer had originally envisioned. The narratives of Hercules Dreyer and Johan Badenhorst contain numerous references to innovative ways in which specific educators used computers to enable this learning-and-teaching approach.

(183) The kind of application that was used in the primary school, for instance, as where one had to write an essay, but, instead of writing it in one’s book, one wrote it on the word processor. In the languages they had examples where they had omitted words and the child had to fill in the correct word or had to cut-and-paste the correct word. Or, the words were above open spaces in the sentence and the child had to cut the correct word from the list and paste it in the correct space below. In this way, the child would learn to cut-and-paste while learning the correct spelling of a word. Or, in the case where two words had the same pronunciations but different spellings, the learner would have to choose the correct one and delete the incorrect one (Johan Badenhorst).

(184) Then, in the case of Geography, there was the example of average rainfall, where the child had to take the project home and physically measure temperature and rainfall over the course of a month. The child would then record the results on a spreadsheet and would generate a graph from the data. There is the geographical component, but there is also the mathematical component relating to averages, as well as graphs, that was integrated into the project (Johan Badenhorst).
What they did with an Afrikaans class in Standard Eight or Standard Nine, was the typography of a poem, in terms of the actual appearance of the poem on the page. What the teacher did was explain to the class that she had typed the poem on a word processor using text wrap, which captured the whole line. She then divided them into groups and explained that the layout of a poem on a page could contribute to the meaning of the poem. She then asked them to alter the layout that she had created in such a way that it contributed to the meaning of the poem. They would then have to explain to the class why they had chosen the specific layout that they had selected (Hercules Dreyer).

One of the lessons that were devised was, for example, where the teacher typed a piece and the children had to insert capital letters and punctuation marks in the right places. So the teacher went along and simply typed a whole lot of lower case letters and it was very easy to mark. We saw how one could simply do a document comparison in Word, and then one could mark the piece in that way. You can immediately see whether the two documents are the same, or where they differ. They used spreadsheets for Mathematics lessons. One of the most interesting lessons I saw was where a teacher dealt with straight line graphs, circle graphs and parabola. The teacher decided to use a spreadsheet because the child plays with the spreadsheet, and, in so doing, realizes what determines the incline (Hercules Dreyer).

4.3.2.8 Learners

Many of the lessons produced by educators in this way seem to have been innovative and creative but at the same time, they embodied the learning-and-teaching approach endorsed by the Project. This certainly seems to be the perception expressed in the extract above. The question that arises at this point is whether the learners who took part in such lessons experienced them in an equally positive way.
In the first place, learners seem to have been energized and motivated by such innovative approaches.

(187) Do you have any idea how badly the children wanted to take out their books in order to see what the poet had done – how the poem had been printed on the page. They couldn’t wait. They asked the teacher whether they could look but she said that she had to see all of their contributions first. How many children do you get who cannot wait to open their books in order to see what a poem looks like? So that was the kind of thing that we did. The change that it brought about in the classroom was incredible – also in relation to the pictures that the little ones could draw. Suddenly the creativity was visible because there were no restrictions on what they could do with their hands (Hercules Dreyer).

Such motivation, experienced in classrooms where computer use came to be associated with innovative learning strategies, evolved fairly quickly into a perceived need for computer-integrated learning. This, in turn, inspired learners to express their views in situations where computer-integrated learning was not taking place, creating a demand-driven ‘micro-economy’.

(188) I think the children force one to go on with computers. You cannot stop because there is a demand – a demand has definitely been created, so you have to address the demand – and it was an excellent demand (Sarie du Plessis).

Learners were, however, not only motivated to express their need for computer-integrated learning in words; they also initiated and became involved in innovative programmes that were designed to ensure the sustainability of such learning.

(189) A further development at the high school was that they had an active Computer Club. The children themselves ran the club, which had an Internet café. This was at Ladybrand High School (Johan Badenhorst).
It is clear that the CALIS Project, though envisaged, planned and implemented programmatically at the regional and district structural levels, spawned the development of tangentially related and systemically integrative programmes at the institutional, educator and learner structural levels that played a significant part in contributing towards the sustainability of the Project.

4.3.3 Physical influences

The programmatic determination of the Project at all structural levels relied heavily on the nature of physical resources that could be harnessed and employed in the effective delivery of computer-integrated education. For the purposes of this study, physical resources will be deemed to refer specifically to those resources created via human intervention that could have influenced the implementation and sustainability of the Project either directly or tangentially. Consideration of the system, defined in this study as consisting of different interrelated structural levels, begins with an account of various influences on the international level. In the case of physical influences, the existence of certain technologies at the international level, and the paucity of alternate technologies, resulted in physical realities within which the Project was to be determined.

4.3.3.1 International

The learning-and-teaching strategy upon which the Project was founded has already been addressed. The idea that there should be enough computers in a classroom to ensure that a third of the class could interact with them at any given time is said to have had its roots in an educational philosophy informed, partly, by cooperative learning principles and those relating to social constructivist practice. Once again, learning-and-teaching strategy cannot be separated off from the realities of available physical resources. Johan Badenhorst suggests a far more mundane, pragmatic reason for installing eight computers in a classroom.

(190) I think the reasoning behind having eight computers in a classroom was based on the fact that you could connect eight computers to a printer (Johan Badenhorst).

So, programmatic aspects of the Project, geared towards successful implementation and sustainability of the Project, cannot be extricated from the physical context within which they found expression - without doing damage to the network of interrelated bonds that characterise a complex system.
But the complexity of the system does not end there. Just as computer hardware and connectivity directly influenced the success of the Project, so also financial means, though less directly visible, influenced the success of the Project at all structural levels. The interface between financial means and computer hardware and software is perhaps most clearly visible on the structural level of the individual institution.

With the advent of Windows, the need for more expansive computer memory intensified, but, possibly because economies of scale had not yet been established, the price of computer memory was still exorbitantly high. The OFSED, suffering as it did from the financial constraints already documented, was unable to purchase computer memory for individual institutions. Consequently, institutions had to purchase such memory from their own funds. At this point, the Project ceased to be a purely departmentally-driven initiative since institutions had gained a vested interest in the successful implementation and sustainability of the Project.

(191) I remember that when schools’ computers were upgraded, at the time, they had to pay the R1000-00 for 1 meg of memory out of their own pockets so that Windows could be loaded on their computers. How many meg do we put into a computer nowadays – R1000-00 for 1 meg of memory! (Hercules Dreyer)

It was not, however, the programmatic aspect of the Project alone that was affected by the availability of physical resources. The arrival of Windows heralded the appearance of the graphical user interface that was far more intuitive and user-friendly than the intimidating Dos-based interface. This, in itself, would have made computers more attractive to users, amongst whom the educators in the Free State region of South Africa. But the advent of Windows heralded something else that was a far more powerful lever for encouraging users to embrace the new technology – the multimedia personal computer. At this point, says Igno van Niekerk, educators found the allure of computers irresistible.

(192) I bought my first multimedia computer while I was at Voortrekker High School – it took the technician two nights just to get the sound to work. That was Windows 3.1 – with 2 meg RAM. We thought it was wonderful. When that thing made music for the first time, it was wonderful, and it was at
that point that teachers could no longer resist computers  
(Igno van Niekerk).

So, the existence of particular hardware and software at the international structural level nudged individual institutions and individual educators, at different structural levels, towards the adoption of the new technology. Similarly, the regional and project levels of the system were influenced directly by physical realities. If the advent of Windows and multimedia computing encouraged individual institutions and educators to embrace computers on the basis of possibilities relating to site-based functionality, then the concurrent emergence of the networked computer and the Internet encouraged the managers of the Project to investigate the possibilities posed by computers for wider systemic functionality. In this connectivity, as expressed by Dr Venter above, they saw the possibility of enabling effective communication, not only vertically from Department to educator, but also horizontally within the various structural levels of the system.

(193) At some point, they went overseas to look at modems and that type of thing (Igno van Niekerk).

The developments in the physical environment mentioned above influenced the use of computers in education in general, since they affected essentially hardware and operating systems. Although such developments enabled more effective and user-friendly access to the computer, there was still a relative paucity of educational software applications that supported the express learning-and-teaching strategy advocated by the architects of the Project. This necessitated the development of suitable software by educators in the region. A good example of such software was the Foundation Phase reading programme developed by Ronel Calitz. Although these applications are possibly primitive by today’s standards, they must have fostered a sense of self-reliance – referred to by Dr Venter in his short speech at the last expo.

(194) That was, naturally one of the problems in the computer world: if you look at the curriculum, most of the software packages had to be used for drill and practice. Now, she and Ronel – and there’s a woman for you – developed programmes – but these were essentially drill and practice. In those days it was difficult to encourage self-directed learning – it wasn’t that easy (Peet Venter).
The existence of software, in the international arena, that could be employed by educators involved in the Project must be seen against the backdrop of software packages that were freely available and in use in South Africa at the time.

4.3.3.2 National

National physical influences on the implementation and sustainability of the Project, as addressed by participants in the study, focus on the availability and widespread use of a number of software packages. Most of these packages were inexpensive or free shareware applications.

(195) And then I saw – wow – you could look at certain programmes in English, for instance, and there were software exhibitions. The Rose Reading Programme was there and the person who developed the programme was Ronel Calitz, I think. The software that they had and that I was interested in was shareware that I could get for free. That was on an old floppy disc. The Internet did not exist at that stage. Tim Berners Lee was still very busy on his little computer somewhere. So what we did was I took some floppies and got about 50 programmes for R100.00 to R150.00 from shareware libraries. And then you played with the shareware (Ignan van Niekerk).

But two specific software applications seem to have played a very particular role in enabling computer-integrated education. True to systemic functionality and the interrelatedness of influences, the initial impetus for the use of these packages sprang, not from a desire to integrate computers into classroom practice, but rather from the need for administrative tools that promised to free educators from onerous, time-consuming activities. As Easy As was a spreadsheet application and Framework a word processing application, used specifically by educators to manipulate learner marks and type examination papers and notes. In this way educators became computer literate in the process of going about their daily tasks.

(196) At the time, they worked on the ‘As Easy As’ spreadsheet, and it was very inexpensive to show them things (Ignan van Niekerk).
So, after the Commodores, the Microsoft stuff arrived. That was when the first IBM-compatibles arrived and we started working with a programme like ‘Framework’, which enabled teachers to type their own notes and examination papers. Teachers were encouraged to do this. So, the application and the training were to the advantage of teachers themselves (Johan Badenhorst).

Partly because of the paucity of educational software packages, and partly because spreadsheet and word processing software was widely available to educators in the region, Hercules Dreyer approached Renate Lippert, head of the CIE Programme at the University of Pretoria, to advise the managers of the Project on best practices in using the available software to enable computer-integrated education.

Let me go back one step: what software were we supposed to use? Nobody knew. The software that was in use was American or British and did not really work in our schools. So what we did, with the help of Renate Lippert, was examine how we could use standard software such as a spreadsheet and a word processor. These normal programmes were used to develop computer-integrated lessons, and the most incredibly interesting things were developed. They started swapping lessons amongst each other (Hercules Dreyer.)

In this way, the unpredictability of mutual intra-systemic causality was seized upon by the managers of the Project as an opportunity to turn the state of affairs to the advantage of computer-integrated education. The reaction of educators to the use of available software packages is attested to by Sarie du Plessis.

The computer itself is really a valuable resource: you have the calculator; you have Paint; you have all those different things. So, I really think one can do quite a bit without all those grand programmes (Sarie du Plessis).
4.3.3.3 Regional

Yet another physical influence, the nature of which could not have been predicted fully at the inception of the Project, was brought about by the commitment of Dr Gert Heyns to the Project. Mention has already been made of the fortuitous predisposition of the Director General Education (Free State region) in favour of the use of computers in the classroom. The attitude of Mr Heyns had a tangibly positive influence on the acquisition of physical resources for the Project. He was in the ideal position to provide the Project with the financial resources that enabled the purchase of hardware and software for schools.

(200) We were in the perfect position because we were a small department and top management were well-disposed towards the Project. If there was any money available – and there was very little – usually by the end of January, Mr Heyns (who was the director at the time, and who was a very good financial manager) saw that there were certain sections that would not be able to spend their money by the end of the financial year. Then he would call me and tell me that we had to transfer those funds very quickly. In this way we were able to buy a few computers and install them in schools. Some of the expos were also financed in this way (Peet Venter).

4.3.3.4 Project

It was this financial commitment to the sustainability of the Project that went a long way towards enabling the infrastructural setting up of the Project in terms of the delivery of hardware and software to schools.

(201) On the other hand, from the department’s side, we provided as much hardware and software (Microsoft programmes) for the schools as we could. Every year, for a period of four or five years we provided ten or fifteen schools in each of the districts with a few up-to-date computers.
can’t remember the exact numbers, and, unfortunately the paperwork does not exist anymore (Peet Venter).

It was, however, not merely a matter of the OFSED supplying hardware and software and the targeted schools accepting the gift. Schools were also required to commit themselves financially to the Project. As it turns out, such commitment was a powerful lever for ensuring the sustainability of the project after the withdrawal of Departmental support.

(202) But then we realised that we would not be able to buy enough computers. We wanted a commitment from the schools. We then said that we would not be buying computers, but rather subsidizing schools. So we told schools to get a quotation from local IT suppliers and, in the process, we would be supporting them too. They had to get a price per computer. Whatever the price was, it was lower than the state tender price, since prices had dropped. By buying computers locally, it would be much cheaper and we would be able to buy more with our limited funds. We then promised schools that for every five computers they purchased, we would purchase ten. We told them that they would have to raise the funds for five computers. In this way, we could install far more computers in schools than would otherwise have been the case (Hercules Dreyer).

Furthermore, when Departmental support for the Project was withdrawn in 1996, the delivery of physical resources in the form of hardware, software and Internet connectivity to the targeted schools had virtually been completed – not only in terms of the CALIS Project but also in terms of the inextricably related FRENET and FRETEL Projects.

(203) Here, at head office, we had a large system where we connected everything by means of modems – all at the incredible speed of 14 400 baud. And, at the centres, we had dial-up modems and cabling that enabled the schools to communicate, and to which schools could connect. The idea was that we would have a complete e-mail system, but also that we would eventually have Internet access (Johan Badenhorst).
(204) The infrastructure was unbelievable – towards the end, virtually all the CALIS schools were connected to the department. By 1993, we could communicate with all the CALIS schools by e-mail, and we were able to send out information very quickly (Peet Venter).

(205) At the end of 1993 or the beginning of 1994 we were 100% ready to activate FRENET. FRENET, which stands for ‘Free State Network’, was a project which was developed alongside CALIS. The project was planned in such a way that we used what we called ‘hubs’. These were the places to which schools connected (Johan Badenhorst).

But it was not only the OFSED that provided the financial means for the Project to be implemented and sustained. Absa Bank had instituted a satellite-based training system and found that they had bandwidth to spare. The Bank offered use of the system to all departments of education in the country at very affordable rates. As mentioned above, Dr Venter immediately recognized the potential of such a means of communication. He duly accepted the offer of use. FRETEL was brought about in this way. The involvement of Absa Bank was thus crucial to the success of the FRETEL initiative, and tangential though it was to the CALIS Project, to the success of this Project as well.

(206) In all these little places I said that they should provide the venue and that we would provide the television. At that time there were no satellite dishes, like DSTV. At that time we received a signal from Absa Bank via an ISDN antenna. As long as there was an Absa Bank, we could receive a signal via that antenna, and they were then able to receive a signal at the schools. That was the FRETEL Project, and it was great (Hercules Dreyer).

(207) We did recordings in the studio. The money for this was donated by Absa and it never cost us a cent (Peet Venter).
As far as the CALIS Project itself was concerned, invaluable exposure of educators to the latest available educational software was facilitated at the annual expos. Maureen Dale estimates that there were more than eighty local, regional and national exhibitors at the last expo that she organized.

I got, I think it was just on, – oh, such a long time ago – 80 exhibitors from all over the country who actually came (Maureen Dale).

They were hearing top-class lectures and they were being exposed to phenomenal software, at the same time (Maureen Dale).

Look at what’s on offer and it was good stuff – really good. I mean we used – the entire hall was filled with exhibits right across the stage, down the sides, everything – the staff room was filled with exhibits – the library was filled with exhibits – certain classrooms were filled with exhibits – … (Maureen Dale).

For many of the educators from rural areas who attended the expos, this exposure to the latest software packages would have been extremely informative. Educators who taught in the larger urban centres, more particularly Bloemfontein, Kroonstad, Welkom and Bethlehem, would have had some access to software vendors, and the added luxury of surrounding schools that could share information in this regard. Educators who taught in Bloemfontein had the further advantage of having access to higher education institutions that could be approached for information and help.

4.3.3.5 District

Because of the concentration of economic activity and resources in the larger centres, it is also not surprising that schools in these areas were able to negotiate much higher school fees than their rural counterparts.

But, if you take into consideration school fees, you must remember that if your school – if your parents are paying fees, and the fees are a little bit higher, you must be able to provide them also with
the requirements that modern-day education needs – and the computer is part and parcel of that (Maureen Dale).

The result was that, when Departmental support was withdrawn, these schools were able to bring financial resources to bear in such a way that the financial sustainability of the Project could be ensured.

4.3.3.6 Institution

Given this state of affairs, the impression might be created that no rural schools were able to sustain the Project financially. Paradoxically, this is not the case, as Johan Badenhorst indicates.

(208) Let me see: are there any schools that managed to do this in the absence of extensive material resources? Yes, yes there were schools that literally did things in the classroom with one or two computers. As I said, there were schools that used one or two computers particularly effectively in the remedial classroom. There were people who did very good things with only one or two computers (Johan Badenhorst).

Other influences, both personal and programmatic, played a much larger role in ensuring the sustainability of the Project in the case of some rural schools. The critical role played by personal influences in the case of Ronel Calitz and Sarie du Plessis, both of whom taught at physically under-resourced schools, is documented above.

In fact, management teams at schools in the relatively larger urban areas, even though they had access to some financial resources, had to be creative and disciplined in order to supply the evolving, resource-hungry Project. Maureen Dale relates how she used income obtained from hosting the annual expos to feed the Project in her own school.

You won’t believe me. I sold the stalls – they bought stalls from me and they were prepared to pay to bring their wares here, and so we made a little bit of money on the sideline – not much – and all of the money that was made, I bought computers with for the school. So it wasn’t vast sums but it
was enough to let me buy 20-25 computers and, each year, I would add, and, every now and then, the Department gave me one or two to give me the kick-start in the beginning (Maureen Dale).

(209) And on the grounds that the expo was held there [Eunice Primary School], the Department gave them a couple of computers and equipped the school. She [Maureen Dale] could then keep the computers and continue with the Project. And, because of the good working relationship we had at the teaching centre, we chose her (Peet Venter).

Once more, it is not possible to isolate the role played by physical influences, in ensuring the sustainability of the Project, from personal and programmatic influences discussed above.

4.3.3.7 Educator

Although extensive use was made of generic, available applications like word processing and spreadsheet programmes, the perception amongst participants in the study is that there was a dearth of educational applications on the market. In the same breath, however, participants proceed to explain, as Igno van Niekerk has been quoted as saying, that free or inexpensive shareware that catered for particular subjects and learning areas was available. Besides locally-developed software, like Ronel Calitz’s reading programme, there were clearly proprietary packages that could be implemented within the South African context, even though they had been developed in other countries.

(210) But, in general, one of the biggest problems that we experienced was that there wasn’t any software (Ronel Calitz).

(211) In English there was a programme called “Willie Beamish”, which was about a little boy. I am not sure whether you know the programme. That was the first animation programme about a little boy who rode on a skateboard. He explored various places, and, in this way, the learners were taught how to spell. Then there was another programme called “My Grandmother and Me”, where the learners would click on a shell, for instance, and the shell would
then ‘announce’ that it was a shell. At the end of the exercise there would be a comprehension test – after they had read a little piece. Those were the programmes we used for English (Sarie du Plessis).

(212) I used a little programme called Explorapedia and the learners could do a search, for instance, on farm animals. It was actually a wonderful little programme, and he [her husband] installed it in his classes. But, because he had very old computers, he was limited to using specific software programmes (Ronel Calitz).

The use of particular software packages at particular schools was, of course, critically dependent on the extent to which these institutions could leverage financial resources, either through the collection of school fees or entering into partnerships with external organizations. Ronel Calitz explains how the computer-integrated education effort at the school of which her husband was principal, eventually came to an end as a result of their inability to ensure financial sustainability.

Such financial sustainability, however, is virtually inextricably linked to the kind of adaptive management at institutional level that enabled some institutions to evolve in new directions after the withdrawal of Departmental support.

(213) There was also the problem of trying to keep those things in a good condition. You can get many miles out of an old computer – but only up to a point, and then it becomes impossible. And that was what happened there. He [her husband] never had enough money to upgrade and so his whole little project slowly came to an end, as a result of lack of funds (Ronel Calitz).

So, once again, it is not possible to separate physical influences from other intra-systemic influences such as personal and programmatic ones. In terms of the definitions offered of these influences earlier in this chapter, it may be noted that all of these influences were brought to bear upon the project with the specific purpose of attaining initially-defined goals. But, true to complex systems, influences are not fully determinate and predictability is variable. Were there not also systemic influences that contributed positively to the success of the Project that had not specifically been brought to bear upon the Project with the stated goals in mind?
4.3.4 Systemic influences

In terms of variable systemic influences on the CALIS Project, one of the most important influences must be the emergence of the *Windows* operating system at the international structural level.

4.3.4.1 International

The timing of the CALIS Project was fortuitous in the sense that it coincided with the advent of *Windows* and the resultant explosive growth in computer sales to households. The user-friendly quality of a graphical user interface meant that the computer, previously viewed as the domain of computer programmers working for large corporations, became a household appliance. In this way, the attitude of society towards computers, as essential appliances and not luxury items, was shaped.

(214) *It might sound ironic and far-fetched now, but Bill Gate’s vision was a desktop on every desk in every home in the world. His vision started becoming a reality directly after CALIS was initiated, when guys in South Africa began buying their own home computers (Igno van Niekerk).*

(215) *That was why the Project developed further: the prominence and development of technology in society-at-large, meant that guys were forced to take notice (Johan Badenhorst).*

(216) *CALIS’s timing was perfect in terms of integrating with the further development of computers, in general (Igno van Niekerk).*

(217) *It was the early nineties and Office wasn’t really in place yet. It was put in place at a later date and we then allowed the children to play with the programmes (Ronel Calitz).*

The influence of computers on society was thus not a specifically South African occurrence but an international phenomenon. The Project managers, as disclosed by the participants in
the study, were introduced to the international situation by way of exploratory, conference-driven tours, aimed at seeking best practice in computer-integrated education. There was also the further goal of benchmarking efforts in South Africa against efforts in other parts of the world. There seems to have been a clear perception of the importance of horizontal, synchronic networking across the whole system. Hercules Dreyer relates how, on their first exploratory visit to the United States of America, he became aware of two very important shortcomings in the South African learning-and–teaching strategy, namely ineffective use of existing technologies, and the crucial need for sharing expertise and resources.

(218) The first basic technology that they could not believe we didn’t have was a telephone in each classroom. They said: “How many telephone lines serve each school?” I answered: “Maybe one or two.” And then they asked: “How does the teacher contact the parents? A teacher has to be able to contact them from the classroom. How does the teacher gather information that has to be transmitted to the learners in the classroom?” Right at the beginning of the process, they said that this was the first basic technology that we had to have. We still have a number of schools that don’t have telephones. It’s very interesting (Hercules Dreyer).

(219) A woman stood up and explained how she did it. I thought that she was on the wrong track but I assumed that it was because I was South African. I felt that her suggestion could never work but I didn’t say anything – as you know, we are very proper. As soon as she had finished, the hands shot up and her own teachers started suggesting that her method could never work. And then she would respond: “Why do you think so?”. He would then explain. She would write down the comment and exclaim: “Wow, good idea! I’ll do that!” Another guy would then stand up and disagree with the first. Just because she had the temerity to present her idea, she eventually left there with a great lesson. Imagine what would have happened if she had simply not said anything and kept her idea to herself (Hercules Dreyer).
Some time later, Johan Badenhorst visited New South Wales in Australia with the express purpose of benchmarking the FRENET efforts with regard to educational television against programmes that had been instituted in Australia. His perception was that the right decisions had been made and that the timeframes adopted had been realistic.

(220) What I can say, with reference to FRENET, is that I visited New South Wales in October 1994, and, at that stage, we were a year ahead of them in terms of implementation. They were still in the planning phase while we had already implemented (Johan Badenhorst).

Besides exploratory and benchmarking expeditions to other countries, the Project also gained international exposure through the prize offered at the last expo. Such exposure created an understanding of the importance of what was being attempted in the Free State. Igno van Niekerk not only attended the WCCE Conference in Birmingham in 1996, but was also interviewed on British television. His experience motivated him to employ what he had learnt at the Conference in furthering the aims of Project.

(221) So, in terms of reaching people, there was an international impact – not a very big impact, but in those days we hadn’t heard of globalization. It was different then (Igno van Niekerk).

4.3.4.2 National

Needless to say, the infiltration of computers into society at the international structural level presaged the same process in South African society. But it was not only the advent of Windows and the drive for household computing that spurred the process on in South Africa. The creation of the Internet and its concomitant promise of connectivity and communication would have been heralded with great enthusiasm in a country where great distances separate communities. In this regard, the media became aware of the potential influence of computing and connectivity on the South Africa society. At this point, computer-integrated education was transformed from an essentially foreign idea to an extended use of an appliance that had come to be accepted as a necessity.

(222) Why did schools continue using it after support was withdrawn? On a systemic level, you must remember that between
1993 and 1995 The Star newspaper published a supplement on computers. That was about the time when Windows 3.1 became known. Suddenly computers became important. I remember sitting with Louis du Plessis at the teachers’ centre when we went onto the Internet for the first time. Internet Explorer replaced Netscape Navigator. You could download it free of charge – so the whole system virtually kicked in at that time and, suddenly, computers started featuring in the press (Igno van Niekerk).

(223) The reason why they carried on using them [computers] was simply because they suddenly became a necessity rather than a luxury (Igno van Niekerk).

The preceding account must not be viewed as the reflection of a process that took place overnight. In fact, Igno van Niekerk identifies a South African cultural stereotype that might well have hindered the integration of computers into South African society, but, paradoxically, seems to have worked in favour of the implementation of the CALIS Project.

Prior to 1994, boys and girls in South African schools were offered a choice of subjects from Grade 10 onwards. Traditionally, girls chose subjects such as Home Economics and Typing (for typewriters), in keeping with the culturally-constructed view of girls as prospective employees in a very narrow range of careers. Consequently, boys who chose Typing as a subject were often seen as being effeminate. With the advent of computers, very few male teachers could thus type. When the CALIS Project was launched, however, sanctioned as it was by the OFSED, the opportunity to escape such cultural stereotyping presented itself.

(224) Remember that we are talking about 1993-1995: if you were a male teacher and you could type, you were labelled a homosexual. Nowadays, it would be more acceptable but, in those days, it was different. So nobody could type (Igno van Niekerk).

Just as the coinciding of the CALIS Project with the further development of computers on the international structural level had been fortuitous, so also the coinciding of the CALIS Project with developments in the field of curriculum design on the national structural level was fortuitous.
The first of these developments involved the languages. An attempt was made to introduce a learning-and-teaching strategy that encouraged cooperative learning through effective communication. Also, communication was emphasized above knowledge of formal language structures. In terms of the proposed learning-and-teaching strategy that informed the Project, the two approaches seem to have complemented one another admirably.

(225) But what was very interesting at that stage, and something that worked for me, was that we had just introduced the communicative method in English. The children could make a noise in class. Also, we had just come to the realization that children did not have to work on computers in a one-to-one situation (Ignor van Niekerk).

A second development relating to curricular design was the implementation of the problem-based approach in Mathematics. Dr. Venter, who had been the head of the enrichment centre in Bloemfontein before he had been appointed head of the computer section in the OFSED, was directly involved in promoting the new approach to Mathematics. The approach advocated the precedence of knowledge application in practical settings over the mere memorization and regurgitation of theoretical concepts. Here too the learning-and-teaching strategy advocated by the Project presented practical implementation guidelines for educators who found the new methodology intimidating.

(226) He [Peet Venter] was very involved in the problem-based approach to Mathematics that they set up in the Free State. That was what he got going in primary schools. As a result of that project, he realized that there are alternative methods of teaching. Part of this was the use of group work, where you divided the class into groups and each group was given a different activity (Hercules Dreyer).

(227) I know that many of the teachers who were involved in Peet’s problem-based approach to Mathematics also used computers in their classrooms because the two went well together. You simply give the children a problem to solve and they solve it on the computer (Hercules Dreyer).
Their visit focused more on the problem-based approach in Mathematics, because that happened at the same time (Ronel Calitz).

In addition to these developments in curriculum design, the cause of integrating computers into classroom practice was enhanced by the way in which remedial teaching was approached in South Africa at the time. Remedial teaching took place in a one-to-one situation, where the learner was withdrawn from the academic programme and was then attended to by the remedial educator. The virtually simultaneous emergence of the Project and the reading programme developed by Ronel Calitz, presented remedial teachers with the opportunity of addressing some of their most pressing needs. Thus, remedial teachers were amongst the first to embrace computers as an integral part of classroom practice.

In that regard, it is surprising how many remedial teachers embraced the technology and used it in their single little classrooms where they worked with the learners individually. It was particularly the reading programme – the Rose Reading Programme – that was used very effectively, but that was not all. There were many Mathematics programmes that were used very effectively. We even developed special programmes ourselves (Johan Badenhorst).

The only workstations we came across were in remedial classrooms where people used this reading programme [Rose Reading Programme] specifically for remedial purposes (Ronel Calitz).

4.3.4.3 Regional

Naturally, national systemic influences found expression in regional planning and functioning.

The communicative approach in English and the problem-based approach in Mathematics, documented above, provided contexts within which computer-integrated education could take place effectively.

You have to remember that there were very few support resources for the syllabus at the time. You had to find support
materials and integrate these into the syllabus. There were many things that one would have liked to use. For me, teaching English as I was, it was very easy because the syllabus encouraged communication amongst learners (Ignor van Niekerk).

Regional systemic influences were, however, not fully determined by national policy and directives. The regional structural level was defined partly by attributes or characteristics that were specific to the Free State. At the inception of the Project, there were already five centres in different districts of the Free State that were being used for computer-based education. The reason for this state of affairs was the fact that Computer Studies had been introduced as a subject at secondary school level, but there were very few qualified educators at individual institutions. Furthermore, most schools did not have the necessary infrastructure to enable educators to present the subject on campus. Learners would thus travel from schools to the five centres in order to receive Computer Studies tuition. It was evident to Dr Venter that the centres could serve as district and support centres for the CALIS Project. In fact, the centres could be modified to serve as district contact centres for the proposed FRETEL Project.

(232) At the time, five computer centres had already been established and placed under my control: one in Bloemfontein; one in Welkom; one in Sasolburg; one in Kroonstad; and one in Bethlehem. These centres were used for the teaching of Computer Science in the various districts (Peet Venter).

The regional systemic influence of Computer Studies does not, however, end there. After hardware and software had been installed in schools taking part in the Project, the tuition of Computer Studies could take place on campus. In fact, Computer Studies was, at the time, revised and subsequently presented on both higher and standard grade levels. The popularity of the subject grew, and was further enhanced by the addition of Computer Typing to the curriculum. The latter replaced Typing as a subject. These systemic developments meant that computer-integrated education had become entrenched in the curriculum. In this way, almost inadvertently as far as the planning of the Project was concerned, regional systemic influences contributed to the sustainability of the Project.

(233) There were many high schools that continued using computers, and, soon afterwards, subjects such as Typing and Computyping, as well as Computer Science Standard Grade, were
Regional systemic influences also originated from the larger context within which the Project was implemented. The crucial role played by regional businesses that were prepared to invest in the Project has already been mentioned. Although regional businesses were approached, as part of the programmatic planning of the Project, the extent to which these businesses were willing to support the Project, must also be recognized as a systemic influence not specifically planned for by the Project team. Evidence of the level of their commitment can be found in the number of exhibitors who supported the expos, and in their willingness to sponsor the prizes on offer for the best computer-integrated lessons at these expos.

(234) We also awarded prizes. I can’t remember what those prizes were but the reasoning behind the prizes was not to recognize something as the best; rather, we wanted to reward effort and hard work. We always managed to convince companies to sponsor these prizes (Peet Venter).

(235) We contacted the railways and asked them whether we could use their network and we also spoke to Telkom to find out how we were going to get telephone lines to schools (Hercules Dreyer).

Such commitment by regional businesses was not only limited to financial and product contributions towards the success of the expos. Their involvement also encompassed service beyond the norm in ensuring the successful installation of hardware and software at schools. One must assume that this synergy of efforts on their part stemmed, partly, from the perception that the burgeoning infrastructure presented the prospect of new markets for their products.

I got a place like - what was it called? –TechRoss. They were the initial company that gave me a lot of support in supplying computers to schools so that the other companies could load their software onto them, so that everybody didn’t have to travel from all over the show. They could just pack their disks into a box and come down - fly down - and not have to cart computers and everything. I actually was able to put workstations at the various places and they could load their material onto them (Maureen Dale).
4.3.4.4 District

Although the development of context-specific software was envisioned as one of the further ways in which the CALIS Project would develop, some districts approached such development in a concerted and organized manner, whereas others did not. One such coordinated effort was the production of a Mathematics application for use in the Foundation Phase.

(236) Here in Sasolburg, we had a Mathematics programme for the Foundation Phase that also worked very well. It was developed by the children – under our guidance – and they enjoyed it very much (Ronel Calitz).

The developers and managers of the Project foresaw that the development of educational software might well flow from the implementation of the Project but they might not have foreseen that such development would have taken place on the district level. There are hints here of the self-organization that characterizes dynamic, complex systems.

A systemic influence on the district level that was predictable was the fact that the Project was more likely to be sustainable in resource-rich, financially stable districts rather than those that were not. In the Free State region, the richest district in this regard was the Bloemfontein district. It is thus not surprising that Maureen Dale should have had no hesitation in naming the schools in her district (invariably well-resourced) in which the Project had survived and evolved.

Yes, Grey College, St Michael’s, St Andrew’s, Oranje - I don’t know how well Oranje’s has taken off; Brebner, both higher and primary, and I would say most Model C schools – I really would say most Model C schools. The magnitude and the number vary from school to school and the expertise would vary from school to school (Maureen Dale).

4.3.4.5 Institution

One of the most important institutional systemic influences demonstrates, once again, the paradoxical nature of complex systems, which often develop and evolve in unexpected ways. Hercules Dreyer, as indicated above, often advocated the importance of the creative renewal
of learning materials, almost on an annual basis. Igno van Niekerk, in contrast, demonstrates that the systemic stasis that dictated the passing on of learning materials from one educator to the next in particular institutional environments, assured the continued use of software, and the continued use of computers.

(237) Remember, you become the first guy to use ‘Framework’. You then become knowledgeable, and the next thing that happens is that you have to teach someone else to use the programme. So you learn more and more, and, eventually, you gain confidence (Igno van Niekerk).

(238) Remember what the spin-off is: I use the computer, and then a new teacher arrives at the school. I use ‘Framework’ to type examination papers. That is the process that we use; that’s the way things are done. So the new teacher follows suit (Igno van Niekerk).

This does not mean that stasis was a common characteristic at all schools on the institutional structural level. The system as a whole was evolving, and one of the ways in which the withdrawal of Departmental support influenced such involvement was the fact that in many institutions computers in individual classrooms were withdrawn and placed in venues that later come to be computer centres. One of the important drivers for the process was the realization that financial sustainability of the Project now had to be guaranteed by individual institutions themselves. This meant that school governing bodies and school principals had to take ownership of the computers on the premises, and, by implication, the Project. The implication was thus also that principals had to prove to school governing bodies that the investment in such computer centres was justifiable. One of the ways in which this could be achieved was to enter into partnerships with private computer training companies. Such institutions, however, did not lose sight of the original goal of the Project, namely the integration of computers into the curriculum.

(239) It happened in schools that the school itself took the initiative and the governing body and management of the school decided what would become of the computer laboratories (Sarie du Plessis).
One of the consequences of the CALIS Project was that principals of schools had to take on the responsibility of using the computer centres (Igno van Niekerk).

Many of the projects that were initiated in schools mutated into computer centres as a result of the withdrawal of support that went hand-in-hand with the establishment of the new dispensation. Many schools entered into partnerships with private companies such as Future Kids, but the primary concern remained the integration of computers into the curriculum (Johan Badenhorst).

The involvement of school governing bodies and principals in planning for financial sustainability was recognized as the necessity that it was after the withdrawal of the OFSED from the Project. Although the active involvement of the parent body in ensuring the eventual success of the Project at individual institutions is systemically evident, it is not necessarily the case that all institutions pursued such involvement equally vigorously. It is also true that parent involvement must have depended, partly, on the willingness of parents to be involved. Participants do, however, vouch for parent involvement as an important institutional systemic influence on the sustainability of the Project. Hercules Dreyer relates a vignette wherein the principal of a school compares the acquisition of a computer centre to the purchase of an expensive cricket bat, the owner of which was often looked upon by his pupils with respect and fear.

I think that the parents were made aware of the Project. Merriespruit, a school in Virginia or Welkom, for instance, invited me to address the parents. The parents and staff were invited, and I will never forget the night. The principal had a cricket bat on stage. It was a V-500 or something like that. I know nothing about cricket but, apparently, it was an impressive bat, in those days. He then related a vignette that involved the playing of a cricket match the previous week. Apparently, one of the members of the opposite team had stood up to bat, and the principal’s team members were absolutely terrified. On being asked what the problem was, they explained that the opposite batsman was
going to bat with a V-500. At that point the principal broke off the story and said that he wished to inform the parents and staff that the school now had a V-500. Of course, he was referring to the new computer centre. So, some schools definitely involved the community (Hercules Dreyer).

(243) The parents were invited to many of the talks so that they could be informed of the new approach to teaching and the way in which technology was going to be used (Hercules Dreyer).

Parental support is often perceived as passive – passive in the sense that their time is not devoted to school matters, with the exception of the odd meeting. It is known to involve moral support and even passive financial support. Often schools require either fundraising from parents or direct financial contributions in order to maintain facilities and programmes. But what were schools to do that served communities who were, by and large, unable to contribute financially? An example of such a school was Taibos Primary, where Ronel Calitz had taught. Here, parents were invited to act as monitors in the Foundation Phase classes during the course of the CALIS Project. Each of the three groups in a class would have a parent monitor who would perform administrative and control tasks. In exchange, parents (most of who were not employed) had a certain percentage of the children’s school fees waived. In addition, they received basic computer literacy training, and some training in terms of educational interaction.

(244) Some of those parents were approached and asked whether they would be prepared to help out at school. Because we were working with littler ones, the parents were asked to monitor workstations in order to keep an eye on the children. It was very sweet. They did fantastic work. We trained them in general skills relating to the management of children. We also held weekly meetings with them in order to discuss the problems that they encountered in their classrooms. In the beginning, the teachers also found it strange having parents in their classrooms – but that was a project within a project (Ronel Calitz).
Very thorough reporting was done by the parents, and later by the children, and we really had excellent results (Ronel Calitz).

Ronel indicates that there was also a secondary reason for drawing parents into the Foundation Phase classrooms: by allowing parents to witness, at first hand, the interaction between learners and computers, she could convince them of the efficacy of the Project.

One of the reasons why I involved the parents at Taaibos was because it is not easy to convince parents [of the merits of the Project] (Ronel Calitz).

This form of parent involvement eventually evolved into incorporating parent help in other administrative tasks in the school programme.

Anna: I started out as classroom assistant but, because the school shrank in size, I was transferred to the book room. There I had to run everything. In the end, I assisted in the school office when the lady was not there. I did all their typing, including the typing of examination papers. (Anna: Ronel Calitz).

As mentioned above, one of the systemic influences on national, regional and district levels that actively contributed to the successful implementation and eventual sustainability of the Project, was the way in which remedial teaching was approached at the time. Remedial teachers found that their learners could pace themselves on the computer and that different students could thus happily co-exist in the same class. On mentioning the role played by remedial teaching in the successful implementation and sustainability of the Project at other schools, Ronel replied as follows:

That was the real reason why it worked so well at Taaibos: the whole class was really a remedial class as a result of the disenfranchised background from which they were drawn (Ronel Calitz).
There might well be many reasons why the Project eventually came to an end at Taaibos Primary, but Ronel is adamant that, besides her departure from the school, a major contributing factor was the arrival of a newly-appointed principal and deputy-principal pairing who were not in favour of parents being actively utilized in the official school programme.

(249) When I left, a new principal and deputy-principal were appointed, and they didn’t like the idea of having parents in the classrooms (Ronel Calitz).

It would thus seem, consistent with systemic functionality, that parent involvement was a major institutional systemic influence on the sustainability of the Project.

4.3.4.6 Educator

On the structural level of the educator there may well have been myriad systemic influences that contributed towards the success of the Project, but the following are specifically emphasized by the participants in the study.

In the first place, mention has already been made of the fact that the implementation of the Project at a specific institution empowered educators at that institution to type their own notes, tests and examination papers – as opposed to the time-consuming, and often messy, process of using a roneo machine in combination with wax sheets. In this sense, a systemic driver, though tangentially related to the central concerns of the Project, came into being.

(250) Suddenly, I could type my own examination papers and I could add pictures. This is something one should not lose sight of with relation to the CALIS Project. So, I can’t say that teachers ever stopped using it. I think many of them continued enjoying the fruits of the CALIS Project, albeit unknowingly (Igno van Niekerk).

In the second place, the implementation of the Project at institutions led to the discovery of educational simulation software. It soon became apparent that such simulations, particularly those related to Biology, Physics and Chemistry, held the promise of significant savings in terms of purchasing expensive instrumentation and chemicals used in the classroom.
Even if you are only able to put one or two computers in each classroom, do you know what you are able to do? Do you know how much money you can save on science experiments? There are so many simulations that enable this. You don’t need expensive equipment anymore. Much of the equipment in school is outdated or broken. We should give them simulations so that the child can do the experiment; so that the child can see what happens and how these things work (Hercules Dreyer).

But, beyond such financial considerations, there were substantive educational systemic drivers that had not specifically been foreseen by the planners and initiators of the Project. One of the most difficult challenges encountered in primary schools related to the assessment and remediation of reading in the Foundation Phase. As indicated above, Ronel Calitz’s reading programme addressed exactly these issues, but, because the programme was computer-based, it meant that those educators who wanted to use the reading programme, would by implication, become involved in computer-integrated education.

(252) I was teaching a Standard Two class when Ronel Calitz developed the reading programme [Rose Reading Programme]. My problem was that I found it very difficult to assess children. It is difficult to assess the child’s standard and, as you know, we had to assess throughout. So we started using the reading programme, particularly in Grade Four, and that was how I became involved. Later I started using little shareware programmes. The reason I became involved was to be able to assess the children, and to develop their reading abilities – that was important to me (Sarie du Plessis).

(253) Working with Ronel was amazing. She was a pioneer who opened up a whole new world for me. At the time there was a reading laboratory at the University [of the Free State] but I felt that her programme made it manageable in the classroom situation. That was how many amazing projects started (Sarie du Plessis).
The diverse nature of the three systemic influences at the level of the individual educator mentioned above indicates that a treatment of such influences can never be fully determinate. It is merely an indication of the diverse range of systemic influences that are likely to have influenced the success of the Project.

4.3.4.7 Learners

The existence of centres in various districts of the Free State at which Computer Studies was presented has been discussed above. Another aspect relating to the systemic influence of such centres, not addressed yet, is the fact that learners who attended Computer Studies classes at such centres were introduced to computer-integrated education. Dr Peet Venter claims that learners embraced these classes enthusiastically. Might it not be the case that such an introduction to computer-integrated education, systemically, could have had an influence on the attitudes of certain parents towards the prospective implementation of the Project at the schools attended by their children?

(254) The idea was that the learners could go to those centres after-hours and the staff member on duty would present Computer Studies classes. That was fairly popular amongst learners (Peet Venter).

In this way, the success of the CALIS Project was influenced by systemic factors not necessarily foreseen by the planners and implementers of the Project. An attempt has been made in this chapter thus far to indicate the artificiality of separating off individual influences within a systemically complex, vibrantly interconnected and constantly evolving entity. The discussion has consciously attempted to isolate individual influences for the sake of identification and evaluation, all the while indicating the difficulty of such isolation.

4.3.5 Metaphoric patterning

In this section attention is given to the metaphoric patterning evident in the narratives presented by participants. Such patterning, viewed through the lens of Relevance Theoretic weak implicature, illuminates the connections that define the system as a complex, evolutionary whole. In this sense, metaphoric patterning performs a function even more critical than the evocation of affective states envisioned by Sperber & Wilson (1995) and Pilkington (2000). It makes manifest exactly the quality of complex systems that is difficult to capture when one uses language characterised by the presence of explicature and a narrow range of fully determinate implicatures, namely complexity itself. Just as complex systems
are, in essence, simpler systems that have evolved in complex (often indeterminate) ways, so also metaphor is, in essence, normal language usage that has evolved from explicature and determinate strong implicature to the activation of a wide range of concatenated weak implicatures that are not fully determinate.

One of the perplexing questions that has dogged Relevance theorists regarding the use of metaphor is the following: if metaphor is, in essence, no different from everyday language usage, why would speakers require of their hearers the extra processing effort required to interpret a wide array of fairly indeterminate weak implicatures? Suggestions in the literature have focused on the communication of affective states inextricably bound to the relevant explicatures concerned (Lakoff and Johnson, 1980). It is the thesis of this argument that metaphor performs an even more critical function in communication. It elucidates, and, in fact, embodies the very nature of the complexity that it seeks to communicate.

If the discussion of influences thus far in the chapter has indicated the elements of narrative such as character, theme, setting and chronology in a seemingly disconnected way, then the discussion of metaphor provides the plot that ties these disconnected elements together and animates the whole.

4.3.5.1 Patterning of personhood

The first metaphoric pattern that emerges from the narratives is one relating to personhood – that which constitutes humanity in all its complexity, and the way in which this humanity is situated in wider contexts. But the pattern is also more than that: it presents the humanity of the narrators (perceptive, feeling individuals) as occupying a position on one end of a continuum and the Project itself as a living entity on the opposite end of the continuum. This presentation of the Project as a living entity is emphasised further in patterning related to ‘journeying’, discussed below.

In terms of metaphors relating to the participants and their active participation in the Project, a number of metaphors relate to the perceptive abilities of humans as part-definition of their personhood. The metaphors presented below relate specifically to vision. There is a clear dichotomy in the implicatures evoked by these metaphors. In the case of the first group of metaphors, suggestions relating to sight and clear vision are implicated.
It all depended on the principal and someone on the staff with the necessary drive and a good eye (Igno van Niekerk).

En elke keer hierdie prentjie vat – gee net die geleentheid vir die ou –moenie worry daaroor dat hulle meer weet as jy nie (Hercules Dreyer).

And the picture that I always sketched was the following: give the guy the opportunity; don’t worry if they know more than you do (Hercules Dreyer).

So dit is iets, as jy gaan kyk na die geskiedenis van die wit departement, dan lyk dit soos ‘n blik op twee naweke (Igno van Niekerk).

So, if you look at the history of the white department, it looks like a snapshot of two weekends (Igno van Niekerk).

Hy maak net op die grafiek so twee kurwes (Igno van Niekerk).

All you see is two curves on the graph. (Igno van Niekerk).

So ek wil sê uit ROLIS het daar vir my ‘n nuwe beroep oopgegaan (Sarie du Plessis).

So, CALIS opened up a new career for me (Sarie du Plessis)

The second group of metaphors, however, implicate the prevention of sight or clear-sightedness.

Such prevention is either characterised as agentless or as a direct result of human intervention. Such intervention, though couched in terms relating to acting, weakly implicate human duplicity and the express purpose of obscuring clear-sightedness.

En hulle het so een na die ander het hulle nou maar - het dit weggefade [computers used in the project] (Ronel Calitz)

And so they faded away, one after the other [computers used in the Project] (Ronel Calitz)
Ek is nou indirek betrokke en ek kan dit nou nog nie waag om openlik en direk met die beplanning hier in die departement betrokke te raak nie (Peet Venter).

*I am indirectly involved at the moment but I still cannot be seen to be *openly* involved in departmental planning (Peet Venter).*

Op indirekte wyse, *agter die skerms*, help ek hulle beplan met hulle e-learning-strategie en so aan (Peet Venter).

*Indirectly, behind the scenes, I help them with the planning of their e-learning strategy (Peet Venter).*

*He can keep an audience wrapped like no one can (Maureen Dale).*

In contrast to the dichotomy presented above, there are metaphors implicating the visionary qualities of people such as Dr Peet Venter (as discussed above). Such implicature transcends the dichotomy presented above in the sense that clear-sightedness thwarted by human intervention is overcome by ‘the ability to see beyond the immediately visible’.

Dis maar die ou ding – jy het altyd jou *visionaris*, en as hy net die visie kan daar kry, kry hy ‘n paar pioniers wat dit kan verder vat (Ignō van Niekerk).

*It’s always the same: you always need a visionary, and, once the vision is established, you get a few pioneers who implement (Ignō van Niekerk).*

Such metaphorical patterning suggests the plot-like progression from a situation of physical clear-sightedness, through one characterised by active obscuring of such clear-sightedness, to a situation characterised by the transcendental quality of visionary sight. Such three-part plot-like progressions are visible in a number of metaphoric patterns, as discussed below.

But personhood is characterised by far more than perception enabled by the senses. Personhood encompasses, and is defined by, the quality of mental representation and the world of ideas that transcends the merely physical.
Visionary sight which transcends physical vision is merely an instance of mental representation that transcends perceived physical reality.

Die droom was gewees… (Hercules Dreyer).

The dream was … Hercules Dreyer).

Ons het ‘n droom gehad (Hercules Dreyer).

We had a dream (Hercules Dreyer).

Ek dink rerg ons het soort van ‘n wen idée gehad (Peet Venter).

I really think we had a winning idea (Peet Venter).

This does not negate the physical situatedness of humans within particular physical contexts. Humans are very clearly an integral part of physically-constituted systems. The metaphor implicating life as circus (below) activates further weak implicatures that capture the ambiguity of the human condition embodied in the clown as tragi-comic construct, an image used so dexterously by Shakespeare in his presentation of the clown as Lear’s alter ego.

Persoon X het altyd gepraat van die kinders oorkant die treinspoor (Igno van Niekerk).

Person X always spoke about the children from the other side of the railway tracks (Igno van Niekerk).

So, toe is daar nou ‘n wonderlike sirkus (Igno van Niekerk).

So then there was a wonderful circus (Igno van Niekerk).

But humans are also situated within wider non-physical contexts and systems – systems that often resemble the evolutionary complexity of life itself. In this way, the participants in the study use metaphors that clearly emphasize their own humanity and, almost in the same breath, implicate the living quality (and even personhood) of the Project itself. Thus, in the context of the wider Project as system, it becomes impossible to tell where the participants (as individual humans) end and the Project as supposedly discrete entity begins.

En nou, na tien jaar, nou probeer hulle die goed weer op die been kry (Peet Venter).
And now, after ten years, they are trying to get the thing up and running again (Peet Venter).

Ek sou graag wou gehad het Prof Cronje hulle moes nou betrokke gewees het want hierdie ding het nou ‘n langer lewe voorentoe (Peet Venter).

I would have liked Prof Cronje to be involved now because this thing is likely to live longer (Peet Venter).

Within the context of such interconnectedness, human agency and action takes on a far greater significance. Not only is it an indicator of personhood, but it also determines, to some extent, the direction in which the system as a whole evolves. Given the social, cultural and religious situatedness of the participants and the central role played by Christian symbolism in South African society, it is not surprising that Christian metaphors appear in the narrative produced by participants. One such symbol plays an important role in the ecological patterning of metaphor discussed below. It is, however, the nature of such metaphors that bears closer scrutiny.

In the discussion of educator motivation above, the concept of the educator for whom the profession is a calling was mentioned. That particular concept is taken up and extended in the following metaphors. These metaphors envision the propagators of the Project, not merely as those responding to a calling, but extend this view to include the concept of propagators as both pioneers and missionaries. In Christian terms, such implicatures embody the action of believers who spread the Word (the teachings presented in the Bible). But the ‘Word’, in Christian terms is not merely ‘the living Bible’. It is also a nomen adopted by Christ who the ‘living Word’ is made flesh, and the Redeemer of humanity. If, under such implicature, the propagators of the Project are equated with Christian missionaries, then further weak implicature might well reveal the identification of the Project as being equated with notions of redemption. But whether such weak implicatures are recovered or not, implicatures relating to the Project as living entity seem to is slightly more strongly implicated.

Dis maar die ou ding – jy het altyd jou visionary, en as hy net die visie kan daar kry, kry hy ‘n paar pioniers wat dit kan verder vat (Igno van Niekerk).

It’s always the same: you have your visionary and, once the vision is established, you have a few pioneers who implement (Igno van Niekerk)
Maar nou, daar is nog jou geroep onderwyser (Ignor van Niekerk).
*But you still have teachers for whom it is a calling* (Ignor van Niekerk).

Jy moes hulle nog eers bekeer het lat rekenaars kan werk (Ronel Calitz).
*You first had to convert them to the idea that computers can work* (Ronel Calitz).

Wat ek gepreek het daai tyd was kom net los van daai – kom ons deel die goed (Hercules Dreyer).
*At the time I preached in favour of the sharing of things* (Hercules Dreyer).

Een van die goed wat ons altyd gepreek het… (Hercules Dreyer).
*One of the things we always preached was…* (Hercules Dreyer).

But if human agency and human action are presented above as essentially altruistic, there are numerous metaphors which accentuate the human capacity for violent action, induction of pain and even causation of death. In this way, the dichotomy characterising the metaphors relating to human vision is echoed in the dichotomy relating to human action.

The metaphors presented below exhibit another relevant dichotomy. Metaphors involving violent actions initiated by participants in the study are characterised in an affectively positive way.

… maar wat verskillende vakke getakel het in die proses (Johan Badenhorst).
*… but which tackled various subjects at the same time* (Johan Badenhorst).
Hoe meer ons die **stryd gevoer** het, hoe meer het ons begin agterkom maar die nuwe onderwysdepartment laat nie hierdie tipe projek toe nie (Hercules Dreyer).

*The longer the battle raged, the more aware we became of the fact that the new department would not allow this kind of project (Hercules Dreyer).*

**Jy blaas** ‘n klomp inligting in en wat daarmee gebeur, gebeur daarmee (Ign van Niekerk).

*You blow a lot of information in and what happens to it, happens to it (Ign van Niekerk).*

… en gedink die ouens sal dit **aangryp** (Hercules Dreyer).

*… and thought the guys would grab the opportunity (Hercules Dreyer).*

… as **inligting uitgestamp** die wêreld vol (Ign van Niekerk).

*… and pushed it out as information into the wide world (Ign van Niekerk).*

Ek het geweet as jy vir haar net ‘n **halwe hand gee gryp** sy… (Peet Venter).

*I knew that if you gave her a hand, she would grab it … (Peet Venter).*

*I would have moved heaven and earth (Maureen Dale).*

**Jy klim net in** en jy sê, ok, hier is rekenaars en hier is hierdie nice programme (Sarie du Plessis).

*You simply climb in and start using the computers and the nice software programmes (Sarie du Plessis).*

On the other hand, the violent actions of people not involved in the Project (particularly those of the incoming OFSED) are presented in an affectively negative way.
Geen van die ou Vrystaat onderwys depatement se
inisiatiewe is erken nie – dit is geignoreer en dit was van die
tafel afgevee (Johan Badenhorst).

None of the intitiatives of the old Orange Free State
Education Department were recognised – they were simply
wiped off the table (Johan Badenhorst).

Soos ek sé, hulle het ons nie getrust nie en hulle moes eers
daardie goed soort van afvee van die tafel af (Peet Venter).
As I said, they did not trust us and they had to sort of wipe
everything off the table (Peet Venter).

Hy het nou die laboratoriumperiode so hy jaag die kinders
daar in (Hercules Dreyer).
He has the laboratory period so he chases the children in
(Hercules Dreyer).

Hulle rus die resource centres baie goed toe met
rekenaalokale, maar hulle gaan maar bietjie hals-oor-kop te
werk (Peet Venter).
They supply the resource centres with computer venues but
they tend to do things head-over-heels (Peet Venter).

This dichotomy finds even more forceful expression in metaphors implicating the concept of
participants as victims. In fact, the recovery of further weak implicatures characterises them
as the victims of persecution, induced supposedly by the post 1994 OFSED. Such metaphors
embody concepts not merely relating to violent action in general, but the specific inducement
of bodily harm. Bearing in mind, the religious and social situatedness of the participants in the
study outlined above, the recovery of further weak implicatures suggest an extension of the
concept of participants as missionaries to include the concept of participants as suffering
persecution.

Hulle het rèrig hulself in die voet geskiet wat dit aanbetref
(Peet Venter).
I think they shot themselves in the foot as far as that is
concerned (Peet Venter).
Hulle kon nie meer daardie werk doen nie as gevolg van hulle kon nie ry en by die plekke uitkom nie – in effek is hulle gesny (Peet Venter).

They could not do their work anymore as a result of the fact that they could not ride out to the places – in effect, they had been cut off (Peet Venter).

My gevoel is daar hetniks oorgebleef nie want dit is keelaf gesny (Hercules Dreyer).

I felt that that nothing was left since it had been garrotted (Hercules Dreyer).

Dit was asof dit ‘n ledemaat is wat afgesny is (Hercules Dreyer).

It was as if I had had a limb amputated (Hercules Dreyer).

Toe ek daar weg is in die privaatsektor in sou die begroting gesny het (Ignou van Niekerk).

When I left for the private sector, they were on the point of cutting the budget (Ignou van Niekerk).

You know, the heartbreaking thing is I’m afraid I think it has actually been discarded (Maureen Dale).

As mentioned above, the continuum of life reflected in the metaphors involving personhood includes the presentation of the Project, not only as a living entity, but also as a person. The metaphors quoted below suggest, firstly, that the Project as person suffers the ultimate violence in the form of death, and, secondly, that the death of the Project is brought about by deliberate human agency. In this sense the Project is ‘murdered’.

En nou dat hy dood is… (Ronel Calitz).

And now that he is dead … (Ronel Calitz).

Die projek het … gesneuwel op daai stadium (Johan Badenhorst).

The project … perished at that point (Johan Badenhorst).
Dit is maar dieselfde dinge wat hulle daai tyd **doodedruk** het (Peet Venter).

*But it is the same thing that they *crushed* at that time (Peet Venter).*

Ek dink hulle het nie besef wat hulle daai tyd **doodgemaak** het nie (Peet Venter).

*I don’t think they realised what they *killed* at that time (Peet Venter).*

… en het dit liewers **doodgedruk** (Peet Venter).

*… and rather *crushed* it (Peet Venter).*

Nou, nadat hulle alles **tot niet gemaak** het, … (Peet Venter).

*Now, after everything has been *destroyed*, … (Peet Venter).*

… sentrums van ons het hulle tot **niet gemaak** (Peet Venter).

*… they *destroyed* those centres of ours (Peet Venter).*

My gevoel was die ding is besig om ‘n **stadige dood** te sterf. (Hercules Dreyer).

*My feeling is that the thing was *slowly dying* (Hercules Dreyer).*

Ek dink hulle wou net **sy legacy doodmaak**, om een of ander rede (Igno van Niekerk).

*I think they wanted to *kill his legacy*, for some or other reason (Igno van Niekerk).*

Hulle het ‘n Mr Mopedi aangestel as die hoof daar, en ek dink hy was ‘n **slagoffer** (Igno van Niekerk).

*They appointed Mr Mopedi as the head, and I think he was the *fall guy* (Igno van Niekerk).*

And **that’s where it died**, basically (Maureen Dale).
The recovery of further weak implicatures in the context of the preceding discussion suggests parallels with the history of Christ, as presented in the Bible. Christ has to die in order for the sins of the world to be forgiven. In the process, the Holy Spirit, inextricably linked to God the Father and Christ the Son in the Holy Trinity, is sent out into the world in order to invest human life with hope, faith and charity. So Christ, in dying, is resurrected in the hearts of humans as the Holy Spirit. In similar vein, the Project, offering new hope in terms of pedagogical innovation and excellence is terminated, but from such termination results an evolution of the Project into a different guise, fuelled, as it were, by different forces, as discussed below.

4.3.5.2 Ecological patterning

Whereas the metaphors involving personhood focus very strongly on that which defines personhood and the immediate context of society as distinct from other systems, the metaphoric patterning involving ecological systems emphasises connectedness and situatedness. Here too there is somewhat of a dichotomy. On the one hand, systemic influences shape and determine systemic evolution, but, on the other hand, human intervention (metaphorically embodied in the figure of the farmer) also plays a part in shaping systemic evolution.

Ecological metaphors relating to the systemic functionality of nature emphasise, in the first instance, the concept of nested systems, as indicated in the metaphor used below.

So vir my was dit ‘n groot sukses gewees in die klein ou dammetjie – in die klein ou poeletjie waarin ek geswem het (Ronel Calitz).

So, for me, it was a great success – in the little pond or pool in which I swam (Ronel Calitz).
Such nested systems are, in the second instance, characterised by very particular patterns of growth. Metaphors relating to the growth of ecological systems embody quite vividly Cavallo’s (2004) conception of educational systems as ‘ecological’ or ‘viral’ systems. The metaphors employed in the narratives in this regard also reinforce the central growth thesis adopted by the managers of the Project, namely the establishment of regional ‘growth points’ that would stimulate further uptake of the Project, as discussed above. In this way, the Project becomes a plant that, almost rhizomatically (following the definition posited by Deleuze and Guattari, 1988), becomes self-sustaining.

… kundigheid oor die provinsie sort van tot stand bring wat dan in die nuwe bedeling as groepunte, voedings-gebiede van die agtergeblewe skole kon dien (Peet Venter).

... created know-how throughout the province, so that [these centres] could serve as growth points or feeder centres in the new dispensation (Peet Venter).

Ek dink dit kan ek nogals sien as een van die groot uitvloeisels gewees van hierdie projek (Sarie du Plessis).

I think that it can be seen as one of the important consequences ['outflowings'] of this Project (Sarie du Plessis).

Die wortel – die feit dat ons onderwysers gehad het wat die tools verstaan het (Ignio van Niekerk).

The root of the issue was the fact that we had teachers who knew how to use the tools (Ignio van Niekerk).

However, as some of the other ecological metaphors emphasise, such a ‘self-sustaining’ system is also an integral part of a yet larger system. The metaphor of funds as water, employed below, implicates a view of the Project as an integral part of a larger system upon which it is dependent for its survival.

As daai fondse opdroog … (Hercules Dreyer).

If those funds dry up ... (Hercules Dreyer).
It might seem, given the metaphors viewed thus far, that the metaphorically envisaged ecological systems are stable and fully determinate. There are, however, metaphors that affectively implicate, not only the potential indeterminacy of ecological systems but also the possibility that such systems do no preclude the possibility of destruction or stagnation. So, by way of recovered weak implicatures, the Project as ecological system is neither fully determinate nor immune to either destruction or stagnation.

… want dit sou in ‘n donker poel ingegaan het (Igno van Niekerk).
... because it would have disappeared in a dark pool (Igno van Niekerk).

Wat ek wel weet is dat Persoon X en Persoon Y, wat toe hoof van onderwys was, is toe onder ‘n wolk by die onderwysdepartement weg na aantuigings van korrupsie in die koerante en so (Igno van Niekerk).
What I do know is that Person X and Person Y, who was the head of education at the time, left the Department of Education under a cloud of suspicion after allegations of corruption in the media (Igno van Niekerk).

… in stede van gestagneer het (Igno van Niekerk).
... instead of stagnating (Igno van Niekerk).

In fact, not only is the ecological system indeterminate and prone to destruction and stagnation, but it is also prone to evolutionary production of atypical and undesirable results. The Project, as ecological system, is, by way of contextually-driven recovery of weak implicature, prone to the same dangers.

Dan word dit na ‘n jaar of twee ‘n wit olifant (Johan Badenhorst).
Then it becomes a white elephant after a year or two (Johan Badenhorst).

Jy kan nie daai ding soos ‘n wit olifant hou nie want al wat jy weet van ‘n rekenaar is hoe langer hy staan, hoe minder word hy werd (Igno van Niekerk).
You can’t keep that thing locked away like a white elephant because the one thing you know about a computer is the longer it stands the less it is worth (Igno van Niekerk).

So, what at first appears to be a self-sustaining system (the Project), is in fact part of larger and yet larger systems (structural levels within which Project is situated). But even this situatedness cannot make the smaller system impervious to indeterminacy, destruction, stagnation or the production of atypical and undesirable results. In short, the sustainability of the Project as ecological system cannot be guaranteed by intra-systemic functionality alone.

In this way, human agency, so consistently implicated in the metaphoric patterning relating to personhood finds its way into the larger contexts of nested systems. Not only that, but the recovery of weak implicatures from the metaphor employed below (in conjunction with the socio-religious context outlined above) suggest that such human agency takes the form of custodianship over the natural world, as envisaged in God’s directive to human beings in the Bible. The Project, as ecological system, is also subject to human custodianship.

Jy weet, as iemand vir my ‘n hond in my huis aanbring, dan moet ek die hond kos gee en hom groot kry – hy sal my nou half beskerm op die ou einde maar ek kan nie die hond los - net daar - lat hy vrek nie (Igno van Niekerk).

You know, if someone gives me a dog, I have to feed it and nurture it – it will in all likelyhood protect me, eventually, but I can’t simply leave the dog there to die (Igno van Niekerk).

Such human custodianship of the natural world, given the history of South Africa in general, and the Great Trek in particular, finds embodiment in the image of the pioneer farmer. In the first instance, the pioneer farmer (besides fulfilling the role as missionary) must tame the wild, as indicated in the metaphor employed below. This implicates the turning of teachers away from the classroom practices to which they had became accustomed and preparing them for computer-integrated education.

Dit was die jare wat jy die mense getem het (Ronel Calitz).
Those were the years when you had to tame people (Ronel Calitz).
But this was not where it ended, as indicated below. The propagators of the Project, viewed as pioneer farmers, had to intervene actively in systemic functionality in order to ensure that desirable outcomes were reached.

Daar is nie meer mense wat dit doen nie – hier en daar waar ‘n ding in lekker grond geplant was gaan hy dalk aangaan (Hercules Dreyer).

There aren’t really still people who do it. Here and there, where something has been planted in fertile ground, it might still persist (Hercules Dreyer).

Dit het toe nou die saadjie geplant (Hercules Dreyer).

That was what planted the seed (Hercules Dreyer).

Die ding van so ‘n ding is om die ding heeltyd te laat groei (Hercules Dreyer).

The important thing about this is to allow the thing to grow (Hercules Dreyer).

… moet jy heeltyd kunsmis ingooi (Hercules Dreyer).

... you have to add fertilizer throughout (Hercules Dreyer).

… en jy moet dit water gee (Hercules Dreyer).

... and you have to water it (Hercules Dreyer).

… nie net die ding by plekke in te kry nie maar dit te laat groei as geheel (Hercules Dreyer).

... not only to plant the thing but also to get the thing to grow in its totality (Hercules Dreyer).

Witteberg gebruik Powerpoint in die skoolsaal – ‘n ou moet nooit vergeet dat die wortels daarvan was ROLIS nie (Ign van Niekerk).

Witteberg uses Powerpoint in the school hall – one should never forget that the root of such usage is the CALIS Project (Ign van Niekerk).
One of the prerequisites was that you had to return and plough back what you had learnt; even Johannes Cronje emphasised the ploughing back of knowledge. Then I was assigned to Peet Venter, Hercules and FRETEL and we ploughed back these things into FRETEL (Ignko van Niekerk).

Recovery of further weak implicatures relating to the metaphors quoted below, in the context of the socio-religious situatedness elucidated above, suggest a further relevance of human agency. Not only are humans custodians of the earth, but they also become the sower in the parable of the same name in the Bible. The sower in the parable embodies Christ himself who proclaims the ‘Word’. Some seeds (messages) fall on fertile soil. These grow and prosper. Others fall on rocky ground and are blown away by the wind. Implicated in the parable is a message to the disciples: when Christ has died and been resurrected, they will, in turn, become the sowers. The Project as ‘Word’ is initially propagated by the managers of the Project but, as encompassed in the metaphor relating to ecological or viral growth, further growth and expansion will depend on the ability of ‘converted teachers’ to inspire others to become involved in the Project.

You know, when you cut open an apple, you can see how many seeds there are but when you have the apple seeds, you don’t know how many apples there are. I think they planted many seeds and we don’t even know where all the apples are that those seeds gave rise to (Ignko van Niekerk).
In this way the Project as ecological system and the concept of personhood, as integral part of the ecological system, merge and become one.

Both groups of metaphoric patterning examined thus far implicate vertical characteristics of systemic functionality. But systemic functionality is also horizontally diachronic and involves the evolution of the system over time. The diachronic aspects of systemic functionality find expression in metaphoric patterning depicting the progress of the Project as a journey.

4.3.5.3 Patterning of journeying

The metaphor of journey, in our culture, routinely implicates the traversal of physical space from a beginning to an end. Such traversal is not only defined in terms of the physical distance covered but is also defined by the passage of a certain amount of time.

In the first place, the metaphor of journey thus implicates ‘motion towards’. This motion may take the form of walking, running, or the use of any number of vehicles. If progression of the Project is a journey, then implicatures recovered from the metaphors used below suggest that the enthusiasm of uptake amongst those involved in the Project determined whether they chose to ‘walk’ or ‘run’ towards their goal.

… wat baie opgewonde was en jy weet, en geloop het met dit (Ronel Calitz).
... who were very excited and, you know ‘walked with’ the Project (Ronel Calitz).

Toe was Gibbons en so aan nog daar – dit is baie mooi wat daar geloop het (Johan Badenhorst).
At that point Gibbons and company were still there and it was very beautiful the way they ‘walked with’ it (Johan Badenhorst).
Odendaalsrus was Odensia en Wessel Maree – daar was ook mooi dinge aan die gang wat **geloop** het (Johan Badenhorst).

In Odendaalsrus there was Odensia and Wessel Maree where good things were happening and where they ‘**walked with**’ it (Johan Badenhorst).

By die laerskool was daar definitief ROLIS projekte wat baie mooi **geloop** (Johan Badenhorst).

*At the primary school there were definitely CALIS Projects that were ‘walking’* (Johan Badenhorst).

… wat entoesiasties is wat die dinge laat **loop** (Johan Badenhorst).

… who were enthusiastic amd made things ‘walk’ (Johan Badenhorst).

… so die ROLIS se **voetspore** het aanhou **loop en loop en loop** (Igno van Niekerk).

… so the CALIS **footprints** carried on ‘**walking and walking and walking**’ (Igno van Niekerk).

As die besigheid en die skool kan begin saamwerk, kan jy ‘n **ongelooflike pad stap** in terme van rekenaarondersteunde leer (Igno van Niekerk).

*If business and the school are able to cooperate, you can travel together [on foot] a long way in terms of computer-integrated education* (Igno van Niekerk).

Ou Sarie **loop** vandag nou nog en doen hierdie goed (Igno van Niekerk).

*Old Sarie stills walks around doing these today* (Igno van Niekerk).

… en doen programme en **loop** met daai tipe goed (Igno van Niekerk).

*and does programmes and ‘walks’ with those kinds of things* (Igno van Niekerk).
Sy het absoluut gehardloop met rekenaars goete (Ronel Calitz).

*She absolutely ‘ran’ with computers and things (Ronel Calitz).*

Hulle was almal baie oulike mense en entoesiasties en hulle het soort van gehardloop met die idees wat ons vir hulle gebring het (Peet Venter).

*They were all very nice, enthusiastic people and they sort of ran with the ideas that we brought them (Peet Venter).*

…en hardloop sy… (Peet Venter).

… *and she ran… (Peet Venter).*

En daar is genoeg ouens wat se koppe reg is wat hardloop (Peet Venter).

*And there are enough guys who have the right attitude and who run (Peet Venter).*

… is makliker om te hardloop met Intel en so aan… (Peet Venter).

*... it is easier to run with Intel and the like… (Peet Venter).*

En as jou LF’s nie soort van voor hardloop nie dan gaan die ander ouens nie kom nie (Peet Venter).

*And if your LF’s [Learning Facilitators] don’t sort of run in front, then the other guys don’t follow (Peet Venter).*

Daar is van die LF’s wat nou baie goed daarmee hardloop van die wat ICDL ook kry en wat nou die Intel hardloop (Peet Venter).

*There are a number of LF’s who run very well with it now – those who get the ICDL [International Computer Driver’s Licence] and those who run Intel (Peet Venter).*
Ek glo ons was reg in die weggpringblokke om dit te doen (Hercules Dreyer).

*I am quite sure that we were in the starting blocks, ready to do that* (Hercules Dreyer).

Ek weet Hercules Dreyer en Dr Peet Venter was op daai stadium die twee ouens wat regtig **gehardloop** het (Ignor van Niekerk).

*I know that, at the time, Hercules Dreyer and Dr Peet Venter were the guys who really ran with it* (Ignor van Niekerk).

Hulle was die ouens gewees wat ROLIS **gehardloop** het (Ignor van Niekerk).

*They were the guys who really ran CALIS* (Ignor van Niekerk).

*And, yes, I was sad it did not continue running* (Maureen Dale).

Participants in the Project also made use of an assortment of tools (‘vehicles’) that they sought to implement in furthering the aims of the Project.

En daai ouens wat dan **hardloop** begin die ander ouens **saamtrek** (Peet Venter).

*And the guys who run begin to draw others after them* (Peet Venter).

Ek meen, die wiel word nou tien jaar later - 14 jaar later word die ding weer **herontwerp** (Ronel Calitz).

*I mean, 10 years later – no, 14 years later – the wheel is being discovered again* (Ronel Calitz).

Kan jy dink as ons van daar af **gerol** het want die **wiele** was reeds – die **momentum** was reeds daar (Ignor van Niekerk).
Can you imagine if we had ‘rolled’ from there, because the wheels had been fixed and we had gained momentum (Igno van Niekerk).

Dan is jy so gewoond om onderbreek te word, jy trek jou venster toe – jy wil nie goed gratis hê nie (Igno van Niekerk).

You become so used to being interrupted that you’ roll up’ your window – you don’t want any free goods (Igno van Niekerk).

It was unbelievable admin work to get that thing on the road (Maureen Dale).

Ek weet nie hoeveel honderde skole moet ons nou aan boord kry nie (Sarie du Plessis).

I don’t know how many hundreds of schools we have to get on board now (Sarie du Plessis).

The ‘motion towards the goal’ figured forth in the metaphors quoted above is more than mere motion. The progress is directed by a clearly defined goal and advocacy of the Project is the banner under which such progression takes place.

Dit het nie opgehou nie – Sarie het maar met die banier aanhou loop soos van ouds (Igno van Niekerk).

It did not end – Sarie continued carrying the banner, as she had always done (Igno van Niekerk).

Ek dink Dr Peet het dit baie onder dieselfde vaandel – …(Igno van Niekerk).

I think Dr Peet did it under the same banner - … (Igno van Niekerk).

Ons moes maar stoot om weer op die ou einde te kom by ‘n plek - en ek weet ook nie of is ons al daar nie (Sarie du Plessis).
We had to **press on** to arrive eventually at our **destination** – and I don’t know **whether we are even there yet** (Sarie du Plessis).

In the process of directing the Project in their own particular contexts, participants attempted to control the direction and speed of the journey’. Once again, human agency directs the course of events or the evolution of the Project, and, once again, systemic functionality and development are such that the journey is not without obstacles and hindrances.

Ek was nie **aan die stuur** daarvan nie (Ronel Calitz).  
*I was not **at the helm*** (Ronel Calitz).

Onderwysers van regoor die Vrystaat het gekom en bygewoon en gesien ‘maggies maar hier is ‘n **hele nuwe wêreld** vir die ouens oopgegaan (Peet Venter).  
*Teachers from all over the Free State attended and realized that a **whole new world** had opened up for them* (Peet Venter).

As ek daaraan dink, dink ek Dr Venter het nogals vir ‘n mens **horisonne** gegee wat jy nie geweet het bestaan nie (Sarie du Plessis).  
*Now that I think about it, I think Dr Venter made one aware of **horisons** that one had never even envisaged* (Sarie du Plessis).

Mens moet hou van nuwe goed – met ander woorde jy moet hou – jy moet kan **explore**; nuwe goed moet nie vir jou angs bring nie (Sarie du Plessis).  
*One has to enjoy **discovering** new things – in other words, you must be able to **explore**; new things must not cause you anxiety* (Sarie du Plessis).

Sy’t weer vir my ‘n **nuwe wêreld** oor baanbrekerswerk gedoen – ‘n nuwe wêreld oopgemaak oor lees (Sarie du Plessis).
She was a pioneer and opened up a whole new world for me (Sarie du Plessis).

In daardie proses het ons die skoolhoofde probeer om hulle dan nou daai bruggie oor te steek (Johan Badenhorst).

In the process, we attempted to get the principals to cross that bridge (Johan Badenhorst).

Mens kan duidelik sien waar beland – waar word – wat noem ek dit – pitfalls (Ronel Calitz).

One can see quite clearly where the pitfalls are (Ronel Calitz).

Ja, die slaggate, ja – en mens kan niks daaraan doen nie (Ronel Calitz).

Yes, the potholes – and one can do nothing about it (Ronel Calitz).

In wese het hulle ‘n teerpad afgebreek (Peet Venter).

In actual fact, they destroyed a tar road (Peet Venter).

The implicated hindrances on the journey to reaching the Project’s destination result in unplanned and largely unchartered detours that seem to divert participants from continuing the journey towards the destination, namely the full implementation and sustainability of the Project.

… en deur die bosse geloop en nou wil hulle die teerpad weer bou net daar waar hy was (Peet Venter).

…and blunder through the bushes, and now they want to rebuild the tar road where it originally was (Peet Venter).

Hulle wil nog in die bos rondfoeter jy weet (Peet Venter).

You know, they still want to blunder about in the bush (Peet Venter).

… waar hierdie ouens nog, wil ek amper sê, met die mikstok en die brief rondhardloop (Peet Venter).
... where these guys, in a manner of speaking, still want run around with letters in cleft sticks (Peet Venter).

The obstacles and hindrances thus identified lead on to that which lies at the heart of the metaphoric patterning relating to journeying, namely absence.

In participants’ narratives, frequent references are made to the fact that the Project ‘het doodgeloop’. This Afrikaans expression is used with almost metronomic regularity by almost all participants when referring to the demise of the Project. The compound word contains both ‘dood’ (dead) and ‘loop’ (walk). Both terms resonate particularly loudly in the context of the metaphoric patterning discussed thus far in this particular study. Metaphoric patterning relating to concepts of personhood evokes weak implicatures conceptualising the Project as human, and the demise of the Project involving not only death, but murder.

But, when the two concepts are combined in the expression ‘doodgeloop’, it takes on one or more of the following meanings: “tire oneself out by walking; come to a dead end (street); peter out; fizzle out” (Kritzinger et al, 1986, p.125). In the use of this expression there is thus a confluence and intermingling of implicatures that characterise metaphoric patterning relating to personhood and that relating to journeying. Just as the absence that constitutes ‘death’ characterises personhood patterning, so also the absence that constitutes a ‘dead end’, in the face of an attempt to reach the journey’s destination, characterises the patterning related to journeying.

A: En nadat Ronel nou weg is en die ding het doodgeloop jy kan sien die kinders sukkel, hoor, veral met lees (Ronel Calitz).

A: And once Ronel had left, and the thing had ‘fizzled out’, you could see that the children were battling – particularly with reading (Anna: Ronel Calitz)

A: Glad nie. Dit het doodgeloop, doodgeloop, soos in doodgeloop (Anna: Ronel Calitz).

Not at all – it ‘fizzled out, fizzled out, fizzled out’ (Anna: Ronel Calitz).

…ook op ‘n stadium daar gehad maar dit het ook doodgeloop. (Ronel Calitz).
... at one point they also had that there but it also ‘fizzled out’ (Ronel Calitz).

Ek myself - die rukkie wat ek nog daar was nadat dit doodgeloop het - jy kan sien die kinders sukkel (Ronel Calitz).

I myself, during the short time that I was there, could see how the children battled after it had ‘fizzled out’ (Ronel Calitz).

Hy het later ‘n Future Kids sentrum begin, weet ek, op ‘n stadium, maar ek dink dit het toe maar op die einde ook maar doodgeloop (Johan Badenhorst).

I know that he later began a Future Kids Centre but I think it eventually also ‘fizzled out’ (Johan Badenhorst).

Daar was baie mooi goed aan die gang, maar ek dink daar het dit redelik doodgeloop (Johan Badenhorst).

They did good things there but I think it has ‘fizzled out’ (Johan Badenhorst).

Ek het nie werklik die geleentheid gehad om nou te gaan sien hoe dit aangaan en of dit doodgeloop het nie (Peet Venter).

I haven’t really had the opportunity to see whether it [CALIS Project] continued or whether it ‘fizzled out’ (Peet Venter).

As dit nie vir daai tipe mense was nie, het die goed bloot eenvoudig doodgeloop (Igno van Niekerk).

If it hadn’t been for those kinds of people, things would simply have ‘walked into a dead-end’ /‘fizzled out’ (Igno van Niekerk).

The nature of light patterning in the universe alerts astronomers and cosmologist to the existence of mysterious dark matter that appears to be powerful enough to shape the structure of the universe. In the same way, the metaphoric patterning relating to journeying in participant narratives alerts one and draws one’s attention to the absence that lies at the centre
of such patterning. Implicatures recovered in the context of metaphoric patterning discussed thus far suggest that this absence not only ties in with patterning related to personhood, but that the crux of the journey is the fact that it is not completed. This suggestion finds further support in the next section.

4.3.5.4 Patterning of energy

If a journey is to be completed and the traversal of physical space achieved, sustained propulsion is required. Such propulsion may rely on various sources of energy. The Project as journey finds implicated sources of energy in metaphoric patterning related to the concept of energy.

The first, and possibly most primitive, of energy sources relates to metaphors conceptualising teacher and learner enthusiasm as the igniting of a fire.

Die eerste ekspo wat ons gehou het was ‘n fantastiese sukses gewees, in die sin dat dit het vuur en vlam aan die brand gesteek (Peet Venter).

The first expo we presented was a fantastic success, in the sense that it ignited the fire (Peet Venter).

… en dit het die vlam aan die brand gesteek (Peet Venter).

… and that ignited the fire (Peet Venter).

Nou is hulle vuur en vlam vir dit (Peet Venter).

Now they are consumed by enthusiasm (Peet Venter).

Weet jy hoe het die kinders gebrand om hulle boeke uit te haal om te kyk wat het die digter gedoen (Hercules Dreyer).

Do you know how the children ‘burnt’ with / were consumed by the desire to see what the poet had done? (Hercules Dreyer).

The second source of energy required for propulsion, conceptualised in the narratives via metaphor, is that of electricity. Traditionally, electricity is considered a ‘clean’ source of
energy, but, like fire, it is difficult to produce enough electricity to satisfy the ever-escalating need for energy in this way.

Sy kan ‘n ding baie goed organize – sy is **livewire** wat dit aanbetref (Peet Venter).

*She can organise things very well – in that sense she is a livewire* (Peet Venter).

Jy kan gerus met haar ook praat want sy was ‘n unbelievable **livewire** gewees (Peet Venter).

*You should speak to her because she was also an unbelievable livewire* (Peet Venter).

Jy identifiseer baie vinnig **die bright spark** in die klas (Hercules Dreyer).

*You soon identify the bright spark in the class* (Hercules Dreyer).

In this way, weak implicatures recovered from the interference pattern of different metaphoric patterning in the narratives, conceptualise the sources of energy discussed thus far as propulsion agents in the journey towards sustainability of the Project. But, just as both fire and electricity are inadequate in addressing spiralling energy needs, so also these propulsion agents become ineffective in the face of hindrances and obstacles placed in the path of ensuring the sustainability of the Project. In fact, the withdrawal of government support brings the journey to a dead end, and the perceived hindrances turn into an absence, almost like a black hole in the fabric of space-time. Further propulsion is virtually impossible – unless the energy source is completely unlike its predecessors; unless an energy source can be found that functions according to totally different rules. Enter quantum physics and the concept of nuclear fusion.

What makes energy release during nuclear fusion different from energy release during ignition or electrification (besides the magnitude of energy release), is the fact that the nuclear fusion reaction (at least in theory) becomes self-sustaining. Implicated in the metaphor quoted below, is the conception of government withdrawal from the Project as the withdrawal of energy sources (support) and thus also propulsion. The absence of propulsion leads to the journey being interrupted. In fact, the journey has ‘come to a dead end’ or ‘fizzled out’ (Kritzinger, 1986, p.125). What is needed is an energy source beyond those contemplated
before. The energy source, in fact, cannot be sought outside of the Project. The energy source is the enthusiasm and determination which lies dormant in those already involved in the Project. What is needed to release this dormant energy is a chemical reaction – but not just any chemical reaction; this reaction has to take place at the sub-atomic level, governed as it is by quantum laws. Such a reaction will not only release many magnitudes of energy more than traditional sources, but will also self-sustain.

Dit werk amper soos in die Fisika met uraan wanneer jy die regte bestanddele bymekaar bring. (Peet Venter).

It is similar to what happens in physics when you combine the right ingredients (Peet Venter).

En ons het toe die volgende jaar die ekspo weer herhaal en Hercules was die organiseerder van die ekspo – dit was werklik ‘n ongelooflike katalisator wat die energie losgemaak het (Peet Venter).

We repeated the expo the following year – Hercules was the organisor. It was an unbelievable catalyst that released so much energy (Peet Venter).

Dan kry jy fusion en ‘n helse omtploffing – ek het dit rërig daai tyd gesien met die ROLIS projek (Peet Venter).

Then you get fusion and one hell of an explosion – I really experienced that with the CALIS Project (Peet Venter).

In this way, sustainable propulsion is assured and so also is ‘motion towards’ the destination. As is the case in any complex system, sustainability is ensured by the adaptability of evolutionary (often indeterminate) change, rather than the predictability of linear progression.

Dit is maar dryfkrag van onderwysers – … (Johan Badenhorst).

It is simply the drive that teachers have - … (Johan Badenhorst).

Hulle hoef jou nie te dryf nie. Jy moet jouself kan dryf (Sarie du Plessis).
They don’t have to drive you – you have to be able to drive yourself (Sarie du Plessis).

4.4 Summary

Implicatures recovered in the previous paragraphs, provide the multiple and complex links that elucidate and animate the seemingly discrete influences on the successful implementation and sustainability of the Project, discussed in the first half of this chapter, namely personal, programmatic, physical and systemic influences. Such influences are subject to multiple, mutual, and complex, cause-and-effect relationships that cannot be accounted for in any linear fashion. A Relevance Theoretic consideration of wide ranges of weak implicatures associated with the use of metaphor provides the language of complexity with which complexity it is to be addressed.

In Chapter 5 I bring the findings presented in this chapter into dialogue with the existing literature in the field, and the conceptual framework proposed in Chapter 2.