CHAPTER THREE

THEORETICAL BACKGROUND IN EVALUATION

This chapter presents a review of the theoretical literature relating to evaluation. Educational evaluation and program evaluation are defined, a brief overview of developments in evaluation and an analysis of evaluation models is presented. That discussion and analysis leads to the identification, modification, and implementation of an evaluation model for undertaking the program evaluation of the QSC Project.

A naturalistic and participant-oriented approach was identified to facilitate the involvement by the participants in the evaluation process of the QSC. As Worthen and Sanders (1988, p. 130) suggest, people see things and interpret them in different ways. Thus, multiple, rather than single, realities need to be recorded. This represented a challenge in the process of developing the conceptual model for guiding the program evaluation to enable the evaluation to capture the multiple realities of the participants as well as identify important issues which are shared by and involve the participants as stakeholders in order to guide further developments. The formulation of an evaluation approach for this study is influenced by Worthen's statement that there is "no one way to evaluate" (cited in Teachers as Evaluators Project, 1982a, p. 9). A conceptual model, which is an adaptation of the Stake-Batchler Model and draws upon Owen's (1992) evaluation Forms and Guba and Lincoln's 4GE, was developed for using the QSC as the focus for a case study. The model developed allows a variety of forms of data collection and inquiry including document analysis, questionnaires, interviews, site descriptions, classroom observations, and samples of students' work.

Questions relating to an appraisal of the model for the program evaluation are formulated. As this evaluation process is a search for adequate interpretations and the report will be presented to a variety of audiences including the key participants, the evaluation itself will be subjected to evaluation. This is referred to by various writers as meta-evaluation (for
example, Brinkerhoff, 1983; Worthen and Sanders, 1988). As Kemmis and Stake (1988, p. 129) indicate: "Evaluative studies can be designed and their forms of reporting organised to help readers review their understandings of the quality of what is being evaluated both privately and publicly. When they do so, they also invite readers to become involved in interpreting and reinterpreting the thing to be judged and thus become involved in testing the adequacy of the interpretations. The reader of a book is invited to think about the things the book is about but can also ask about the quality of the book itself. In the same way, an evaluation invites attention to itself as well as to the thing evaluated. The public process of an evaluative study invites those participating in it (whether as evaluators or evaluated), those observing it, and those receiving its reports to see themselves in terms of the relevant public traditions of interpretation. It invites them to become aware that, one way or another, they are participants in public traditions of evaluation."

Therefore, the key participants were invited to make judgements about the evaluation. In particular, their views were sought in relation to the model used to guide the study and to provide reactions to the conduct and product of the evaluation.

3.1 Defining Evaluation and Program Evaluation

In order to review the theoretical background to evaluation it is necessary to examine various definitions of evaluation. Following this examination, a definition of evaluation as it is used in this study is identified. Moreover, the term program evaluation is clarified.

What is evaluation? A review of the literature relating to educational evaluation reveals many definitions of evaluation. These often reflect various purposes for evaluation as shown by the following definitions offered by various writers at different times.

"The process of evaluation is essentially the process of determining to what extent the educational objectives are actually being realised by the program of curriculum and instruction." Tyler (1949)

"The purpose of evaluation is not to prove but to improve." Stufflebeam (1971)

"Systematic educational evaluation consists of a formal appraisal of the quality of educational phenomena." Popham (1988)

Those definitions vary in their indications of the purpose for evaluation. Tyler's definition, for example, emphasises the process of comparing performance data with clearly specified objectives while Stufflebeam's definition highlights the role evaluation might play in
assisting decision-making. Popham's definition focuses on the appraisal of quality and that the evaluation is systematic as opposed to the everyday, informal evaluative acts. From his review of definitions of evaluation, Talmage (1982) noted that:

"Three purposes appear most frequently in definitions of evaluation: (1) to render judgments on the worth of a program; (2) to assist decision-makers responsible for deciding policy; and (3) to serve a political function" (Talmage, 1982, p. 594).

According to Worthen and Sanders (1988, p. 24), the first purpose Talmage lists for evaluation is evaluation - to render judgments of the value of a program. They argue that the other purposes do not describe what evaluation is but rather what it is used for. Worthen and Sanders (1988, p. 24) define evaluation "as the act of rendering judgments to determine value - worth and merit - without questioning or diminishing the important roles evaluation plays in decision-making and political activities". Stake (1967) also focuses on evaluation "as essentially an exercise in judging the worth of something". In addition, Stake (1967; 1975a; 1975b; 1978; 1980) asserted that the two basic tasks of evaluation are description and judgment. According to Stake, the evaluation of an educational activity needs to provide full description and judgment of that which is being evaluated.

Guba and Lincoln (1990), in describing 4GE, have defined evaluation as "a socio-political process that results in an outcome - one or more constructions - that are jointly and collaboratively arrived at with stakeholders" (Guba and Lincoln, 1990, p. 4). The definitions provided by Stake (1967), Worthen and Sanders (1988), and Guba and Lincoln (1990) provide the basis for the definition adopted in this study. That is, evaluation is referred to as the process concerned with clarifying the worth, or merit, of an educational activity and utilizing the principles of 4GE

"characterised by continuing negotiation with all stakeholders in order to determine the focus, the procedures, the interpretations and the proposals for action that guide the evaluation activity and emerge from it" (Guba and Lincoln, 1990, p.3).

Program evaluation in this study refers to the evaluation of an educational program as the evaluation undertaken is school-based. Madaus et al (1983) in providing a historical overview of program evaluation portray program evaluation as a "dynamic, yet immature, profession" (Madaus et al, 1983, p. 18). They indicate that there is a need to "improve
research, training, and financial support for program evaluation” (Madaus et al, 1983, p. 18). That argument has become further evident as Winston (1992, p. 105.4) notes that during the 1980's and into the 1990's, program evaluation has become a key element of program budgeting (Department of Finance, 1987; Corbett, 1989; Robinson, 1992) adopted as an approach by governments throughout Australia. Following the publication by the Department of Finance and Public Service Board of Evaluating Government Programs - A Handbook (1987) and Program Evaluation - A Guide for Program Managers (1989a), there has been an ongoing series of program evaluation publications and papers (Department of Finance, 1989b; 1990; 1991; 1992a; 1992b; 1992c; 1992d; 1992e; 1992f) aimed at providing guidelines for government departments, including education, to undertake evaluations.

3.2 Overview of Developments in Evaluation and Evaluation Models

This section provides an account of key developments in educational evaluation together with an analysis of evaluation models. Models of evaluation have become increasingly evident in the evaluation literature since the 1960's. For example, Guba and Lincoln (1981) identified more than forty which have emerged in the literature since 1967. This section provides a summary of some of these to provide a context for the process of developing an evaluation approach for undertaking a program evaluation of the QSC Project.

The evaluation literature reflects an area of increasingly stronger investigation and interest. For example, the current situation is now different from that described by Worthen and Sanders (1973, p. 1) over twenty years ago in which they stated that evaluation is one of the most widely discussed but little used processes in today's educational systems. They suggested that:

"... only a tiny fraction of the educational programs operating at any level have been evaluated in any but the most cursory fashion, if indeed at all. Verbal statements about education and accountability? An abundance. Genuine evaluation of educational programs? Unfortunately rare." (Worthen and Sanders, 1973, p. 11)

Batchler (1992, p. 5), however, argues that the present situation is different from that to which Worthen and Sanders refer. According to Batchler, early evidence of increased interest in evaluation was provided by the Teachers as Evaluators Project (1978). The Teachers
as Evaluators Project resulted in a series of publications, reports, and case studies (Teachers as Evaluators Project, 1979; 1980a; 1980b; 1980c; 1981; 1982a; 1982b; 1982c; 1982d). Furthermore, Batchler draws attention to the conferences, workshops, and tertiary education courses in evaluation as well as the increased commissioning of evaluations now evident.

In examining developments in evaluation in the United States, Popham (1975, p. 3) notes that the system of public education was considered for many decades to be "one of the nation's finest accomplishments". However, according to Popham, "in the 1950's, dissident voices began to be heard" as critics began to argue that schools were ineffectual. Popham observed that:

"The honeymoon was over. It was no longer a widely held belief that the schools were functioning flawlessly. People began to wonder just how well those schools were doing their jobs. And when you wonder how well something is working, that sets the stage for evaluating it." (Popham, 1975, p. 3)

Thus, the initial motivation in the United States, and consequently Britain and Australia came from accountability for improved outcomes for schools. The criticisms being levelled at schools together with the increasing expenditure on education in school systems throughout the 1960's resulted in demands for the evaluation and justification of that expenditure. Tyler's (1949) definition was typical of the approach to evaluation throughout the 1950's and the 1960's. That is, evaluation was employed to determine the extent to which the educational objectives were being realised through programs of curriculum and instruction. This response in America resulted in the growth of a formal evaluation movement which relied largely on the 'scientific' methodologies of behaviorism and empiricism.

Popham (1975) referred to those early 'models' as goal attainment models. As the evaluation movement developed, dissatisfaction with the narrowness of Tyler's conception provided the catalyst for more comprehensive approaches to be developed. In examining the emergence of evaluation models, Popham (1988, p. 23) used the term 'models' to mean a "set of plans". He noted that the building of educational evaluation models throughout the late 1960's and the early 1970's became a 'fashionable activity' and he observed that for a time it appeared that an educational evaluation model could be generated by anyone who:
Popham (1975) isolated the overriding orientations inherent in the various models and then grouped them into four descriptive categories: viz.

- Goal-attainment models
- Judgmental models emphasising intrinsic criteria
- Judgmental models emphasising extrinsic criteria
- Decision-facilitation models. (Popham, 1975, p. 22)

More recently, Popham (1988, pp. 23-49) produced a revision of his earlier (1975) categorisation. As a result, he employed a five-category descriptive framework. He retained the goal-attainment and decision-facilitation classifications, modified the second and third category descriptors, and identified an additional, fifth category. His five classes of educational models became:

- Goal-attainment models
- Judgmental Models Emphasising Inputs
- Judgmental Models Emphasising Outputs
- Decision-Facilitation Models
- Naturalistic Models (Popham, 1988, p. 24)

Due to their relevance to this study, naturalistic models will be examined in some depth.

Other writers have published classifications of evaluation models (Worthen and Sanders, 1973; Ross and Cronbach, 1976; Curriculum Development Centre, 1977; Stufflebeam and Webster, 1980; Guba and Lincoln, 1981; House, 1983; Madaus, Scriven and Stufflebeam, 1983; Worthen, 1984; Worthen and Sanders, 1988; Owen, 1992). To facilitate the process of selecting and developing an approach for undertaking an evaluation of the QSC, several classification schemas are described (House, 1978; Talmage, 1982; Worthen and Sanders, 1988). Furthermore, Owen's (1992) evaluation Forms are examined later in this chapter to assist in choosing the most appropriate approach to program evaluation of the QSC. Owen (1992, p. 78.1) indicates that his evaluation Forms provide a framework for "flexibly selecting and using the most appropriate approach, bearing in mind the state of current development of a given program". He refers to Day's (1991) observation that what appears to be missing are guidelines for choosing an appropriate approach best suited to a particular situation. Following this discussion, an analysis of 4GE is presented to facilitate the development and description of an approach to evaluating the QSC.
House (1983) presented a taxonomy of evaluation models making use of the classifications of several writers (Stake, 1967; Worthen and Sanders, 1973; Popham, 1975). He identified eight models - systems analysis, behavioural objectives, decision making, goal free, art criticism, accreditation, adversary, and transaction. Table 3.1 below provides an extension of House's model by including the more recently developed 4GE form of evaluation proposed by Guba and Lincoln (1989). House's model highlighted the critical dimensions of comparison - the audiences to whom the evaluation is addressed, what the model assumes consensus on, the methodology of data collection, the ultimate outcome expected, and the typical question that the approach tries to address.

### Table 3.1 A Taxonomy of Major Evaluation Models

(Adapted from House, 1983, p. 48)

<table>
<thead>
<tr>
<th>Model</th>
<th>Proponents</th>
<th>Major Audiences</th>
<th>Assumes Consensus On</th>
<th>Methodology</th>
<th>Outcome</th>
<th>Typical Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Systems Analysis</td>
<td>Rivlin</td>
<td>Economists, managers</td>
<td>Goals; known cause &amp; effect; quantified variables.</td>
<td>PBBS; linear programming; planned variation; cost benefit analysis.</td>
<td>Efficiency</td>
<td>Are the expected effects achieved? Can the effects be achieved more economically? What are the most efficient programs?</td>
</tr>
<tr>
<td>Behavioral</td>
<td>Tyler, Popham</td>
<td>Managers, psychologists</td>
<td>Prespecified objectives;</td>
<td>Behavioral Objectives; quantified outcome variables</td>
<td>Productivity</td>
<td>Are the students achieving the objectives? Is the teacher producing?</td>
</tr>
<tr>
<td>Decision Making</td>
<td>Shattuck, Akin</td>
<td>Decision-makers, esp. administrators</td>
<td>General goals; criteria</td>
<td>Surveys, questionnaires, interviews, natural variation</td>
<td>Effectiveness</td>
<td>Is the program effective? What parts are effective?</td>
</tr>
<tr>
<td>Goal Free</td>
<td>Scriven</td>
<td>Consumers</td>
<td>Consequences; criteria</td>
<td>Bias control; logical analysis; modus operandii</td>
<td>Consumer choice</td>
<td>What are all the effects?</td>
</tr>
<tr>
<td>Art Criticism</td>
<td>Elsner, Kelly</td>
<td>Connoisseurs, Critics, Consumers</td>
<td>Critic standards</td>
<td>Critical review</td>
<td>Improved standards</td>
<td>Would a critic approve this program?</td>
</tr>
<tr>
<td>Accreditation</td>
<td>North Central Association</td>
<td>Teachers, public</td>
<td>Criteria, panel, procedures</td>
<td>Review by panel; self-study</td>
<td>Professional acceptance</td>
<td>How would professionals rate this program?</td>
</tr>
<tr>
<td>Adversary</td>
<td>Owens, Levine, Wolf</td>
<td>Jury</td>
<td>Procedures and Judges</td>
<td>Quasilegal procedures</td>
<td>Resolution</td>
<td>What are the arguments for and against the program?</td>
</tr>
<tr>
<td>Transaction</td>
<td>Stake, Smith Macdonald, Parlett and Hamilton</td>
<td>Client, Practitioners</td>
<td>Negotiations; activities</td>
<td>Case studies, interviews, observations</td>
<td>Understanding; diversity</td>
<td>What does the program look like to different people?</td>
</tr>
<tr>
<td>Fourth Generation Evaluation</td>
<td>Guba and Lincoln</td>
<td>Stakeholders, Focus of the evaluation, procedures, interpretations, activities agreed to by proposals for stakeholders action that guide the evaluation</td>
<td>Socio-political constructivist process</td>
<td>Responsive focusing</td>
<td>Constructions collaboratively arrived at</td>
<td>What are the constructions of the various stakeholders? What action occurs during and from the evaluation?</td>
</tr>
</tbody>
</table>

Theoretical Background in Evaluation
House (1983, p. 47) argues that the “current models all derive from the philosophy of liberalism, with deviations from the mainstream being responsible for the differences in approaches”. According to House, there are identifiable key liberal ideas such as choice, individualism, competitiveness, empiricism, and the models also assume a free market place of ideas in which the consumers will ‘buy’ the best ideas. A further adaptation of House’s schema, as displayed in Figure 3.1, provides a proposal for locating 4GE evaluation models as they relate to liberalism. In that figure, House (1983, p. 49) describes the top four models as utilitarian which he indicates refers to maximising happiness in society. He labels the bottom four models as intuitionist/pluralist. House (1983, p. 50) indicates that the ethical principles in the intuitionist/pluralist domain are not single in number nor explicitly defined as in utilitarianism. For House, the ultimate criteria of what is good and right are seen as individual feelings or apprehensions.

![Figure 3.1. A Schema Relating Major Evaluation Models to the Philosophy of Liberalism](Adapted from House, 1983, p. 49)
Worthen and Sanders (1988, p. 60) also developed a classification schema. They classified the many different approaches to evaluation into the following six categories. They suggest that it should be noted that these frameworks refer to conceptual approaches to evaluation, and not techniques.

1. **Objectives-oriented approaches**, where the focus is on specifying goals and objectives and determining the extent to which they have been attained.
2. **Management-oriented approaches**, where the central concern is on identifying and meeting the informational needs of managerial decision-makers.
3. **Consumer-oriented approaches**, where the central issue is developing evaluative information on educational "products", broadly defined, for use by educational consumers in choosing among competing curricula, instructional products, and the like.
4. **Expertise-oriented approaches**, which depend primarily on the direct application of professional expertise to judge the quality of educational endeavours.
5. **Adversary-oriented approaches**, where planned opposition in points of view of different evaluators (pro and con) is the central focus of the evaluation.
6. **Naturalistic and participant-oriented approaches**, where naturalistic inquiry and involvement of participants (stakeholders in that which is evaluated) are central in determining the values, criteria, needs, and data for the evaluation.

Worthen and Sanders' classification schema enables the identification of the driving force behind the evaluation, the major questions to be addressed, and the major organiser/s; e.g., is the evaluation to provide information for objectives or management decisions? Furthermore, Worthen and Sanders (1988, pp. 60-61) suggest that these six categories seem to be able to be distributed along House's (1983) dimension of utilitarian to intuitionist-pluralist evaluation as shown below in Figure 3.2. Again, the model has been adapted and extended to propose the inclusion of 4GE as an additional seventh category.

![Figure 3.2. Distribution of Seven Evaluation Approaches on the Dimension of Utilitarian to Intuitionist-Pluralist Evaluation](image-url)

This overview of developments in evaluation and the analysis of evaluation models through presenting the classification schemas developed by various writers (Popham, 1975; House, 1983; Worthen and Sanders, 1973, 1988) highlighted the variety of approaches
In selecting and developing an evaluation approach for this study, it is worth noting Worthen and Sanders's observation following their examination of how epistemological issues, methodological preferences, metaphoric views of evaluation, different needs, and practical issues contribute to the diversity of evaluation approaches that:

"Regardless of which view you subscribe to, it is clear that either the inability to generate an idealistic evaluation model (after all, none has been forthcoming since the call for synthesis nearly a decade ago) or resistance to trading the diversity of models for a unified view accounts, at least in part, for the continued variety of approaches that confronts the evaluation practitioner." (Worthen and Sanders, 1988, p. 59)

In addition, Worthen and Sanders view quantitative and qualitative methods as compatible, complementary approaches in the evaluation of educational programs. They view both forms of methodology as appropriate, depending on the purpose and the questions for which the study is conducted. Stone's (1984) comment about educational research in general seems to extend to evaluation as well:

"Today in educational research,... the trend is methodological pluralism and eclecticism. Many formerly devout quantitative researchers are now trying their hands at qualitative inquiry. The vigorous quantitative/qualitative debate, if not dead, is somehow buried." (Stone, 1984, p. 1)

Therefore, in selecting and developing an approach for undertaking an evaluation of the QSC, there was not available a single model or approach which could have been considered to be either the only approach or the best approach. However, it is possible and desirable to draw upon the features of various models to develop a framework which can accommodate the evaluation questions formulated and presented in Table 1.2, and can guide the data collection and its interpretation. The framework developed can also provide guidance for the writing of the evaluation report and for future school-based evaluations in this field.

To assist in this process, various models were examined and it became evident that the more qualitative methods using naturalistic and participant-oriented approaches as described by Worthen and Sanders (1988) and fourth generation evaluation (4GE) approaches proposed by Guba and Lincoln (1989) seemed to reflect possible ways of guiding this study. Naturalistic and participant-oriented approaches are similar to House's (1983) transaction and Popham's (1988) naturalistic models. These are examined together with 4GE following an analysis of Stake's Countenance Model and responsive evaluation. Illuminative evaluation, action
research and action evaluation are also discussed as possible approaches in formulating a framework for evaluating the QSC Project.

### 3.3 Stake's Countenance Model and Responsive Evaluation

Stake's work is discussed in some detail in this section as it provides the basis for the model developed for use in this study. Stake's (1967) *The Countenance of Educational Evaluation*, had a profound impact upon thinking about educational evaluation. Stake (1967, 1975a, 1975b, 1978, 1980) asserted that the two basic tasks of evaluation are *description* and *judgment*. That is, the evaluation of an educational activity needs to provide full description and judgment of that which is being evaluated. Stake's framework, shown in Figure 3.3, enables the evaluator to plan, think, and work through the process of a complete evaluation.

![Stake's Layout of Statements and Data to be Collected by the Evaluator of an Educational Program](source: Stake, 1967)

**Figure 3.3:** Stake's Layout of Statements and Data to be Collected by the Evaluator of an Educational Program (Source: Stake, 1967)

His later writing (Stake, 1972, 1975b, 1978, 1980) expanded on this and addressed the need to consider the *stakeholder* audience through the notion of *responsive evaluation*. The ultimate test of the validity of an evaluation is the extent to which it increases the audience's
understanding of the educational program being evaluated. Accordingly, an educational evaluation is **responsive evaluation**:

"if it orients more directly to program activities than to program intents; responds to audience requirements for information; and if the different value-perspectives present are referred to in reporting the success and failure of the program." (Stake, 1975a, p.14)

Stake describes the responsive evaluator’s role in the following way:

"To do a responsive evaluation, the evaluator of course does many things. He makes a plan of observations and negotiations. He arranges for various persons to observe the program. With their help he prepares for brief narratives, portrayals, product displays, graphs, etc. He finds out what is of value to his audience. He gathers expressions of worth from various individuals whose points of view differ. Of course, he checks the quality of his records. He gets program personnel to react to the accuracy of his portrayals. He gets authority figures to react to the importance of various findings. He gets audience members to react to the relevance of his findings. He does much of this informally, iterating, and keeping a record of action and reaction. He chooses media accessible to his audiences to increase the likelihood and fidelity of communication. He might prepare a final written report; he might not - depending on what he and his clients have agreed on." (Stake, 1975b, p.11)

A **naturalistic and participant-oriented** approach to evaluation, according to Stake (1978), has appeal in four ways. Firstly, it helps audiences for the evaluation understand the program if we pay attention to the natural way in which we understand and communicate about things. Secondly, knowledge gained from experience facilitates human understanding and extends human experience. Thirdly, naturalistic generalizations, which are arrived at by recognizing similarities of objects and issues in and out of context, are developed through experience. Fourthly, by studying single objects, people accumulate experiences that may be used to recognize similarities in other objects. In that way, we add to existing experience and human understanding.

In clarifying how to do the evaluation, Stake (1975) identified twelve recurring events and developed these to be seen as the face of a clock (Figure 3.4). On Stake's 'clock', any event can follow any event and the evaluator may return to any event many times during the course of an evaluation. In addition, according to Stake, many events can occur at the same time. The 'clock' in this way alerts evaluators that "flexibility is an important part of using this naturalistic and participant-oriented approach" (Worthen and Sanders, 1988, p. 136).
Furthermore, Stake distinguishes 'responsive' from 'preordinate' evaluation. For example, as a responsive evaluation proceeds, "new issues might emerge and already identified issues be refined" (Kemmis and Stake, 1988, p. 67) whereas 'preordinate' evaluation emphasises "(1) statement of goals, (2) use of objective tests, (3) standards held by program personnel, and (4) research-type reports" (Stake, 1975, p. 14). This distinction is further highlighted by the statement by Kemmis and Stake (1988, p. 67) that:

"Preordinate evaluation may answer the questions some people ask, especially those responsible for the program, but different program and evaluation audiences may have different concerns. Using issues to orient an evaluation study and make it 'responsive' is a way of giving a more holistic account of a curriculum and addressing the variety of concerns people have about it."

This review of responsive evaluation not only permits, but suggests that it is desirable to use a range of data sources which might include standardised tests, observations, questionnaires and interviews. The QSC program evaluation aims to be responsive to the concerns of the individuals for whom the evaluation is being conducted. Hence, the QSC evaluation was able to be undertaken following a scholarship being awarded with the main aim of producing an evaluation report which dealt with the main issues that were perceived as
being important by the main stakeholders; i.e. Central and Regional Office personnel, administrators, teachers, students, and parents involved in the project. In this way, it is argued that the evaluation would fulfill the dual role of providing feedback to the participants as well as identify and analyse issues to assist in the formulation, implementation and evaluation of further learning technology initiatives in schools.

Illuminative evaluation, action research, and action evaluation are discussed briefly to identify further implications for developing an evaluation approach for this study.

3.4 Illuminative Evaluation

For the purpose of illuminating problems, issues, and significant features of a program, Parlett and Hamilton (1976) have suggested an evaluation approach, which they called illuminative evaluation. According to Parlett and Hamilton, it is important to study the context of school programs due to the variety of factors which influence programs. Some of these might include constraints (administrative, financial...), educators' individual characteristics (teaching style, experience...), and students' perspectives. In addition, they suggest that the introduction of changes within the school context might produce unintended and additional effects. For the illuminative evaluator, the task is to discover, document, and discuss what the innovation comprises and what it means to be a participant involved in it. While not directly addressing educational computing, Parlett and Hamilton's illuminative evaluation relates to the argument by Green and Bigum (1990) presented earlier in Chapter Two in this report that, in relation to studies of educational computing:

"...these 'areas of silence' - the 'unsaid' - which must be investigated, those unsymptomatic absences in the discourse of educational computing that speak to its investments and secret impulses and that must be interrogated and illuminated." (Green and Bigum, 1990, p. 370)

3.5 Action Research and Action Evaluation

The intention of action research is "to give persons the power to act to bring about change by generating knowledge through rational reflection on personal experience..."
The term was developed by Lewin to attempt to link social science experimentation and action in response to social problems. Davis (1987) describes action research as:

"a systematic process whereby practitioners voluntarily engage in a spiral of reflection, documentation, and action in order to understand more fully the nature and/or consequences of aspects of their practice with a view to shaping further action or changing their current situation preferably in collaboration with colleagues." (Davis, 1987, p. 3)

Thorne (1990, p. 82) notes that there are four fundamental aspects of action research which are dependent on each other and are called **moments** in the overall strategy. The four moments are:

1. to develop a plan of action to improve what is already happening;
2. to act to implement the plan;
3. to observe the effects of action in the context in which it occurs; and
4. to reflect on these effects as a basis for further planning, subsequent action and so on.”
(Kemmis and McTaggart, 1982, p. 7)

The model which portrays the action research spiral is represented in Figure 3.5 below.

![Figure 3.5: The Action Research Spiral](Source: Kemmis and McTaggart, 1982, p. 8)
Kemmis and McTaggart (1988, pp. 22-23) describe action research developing through that self-reflective spiral which involves "planning, acting, (implementing plans), observing (systematically), reflecting... and then re-planning, further implementation, observing and reflecting". Thus, action research is an approach in which people work towards the improvement of their own practices and consequently it is an approach to improving education by changing practices and learning from the consequences of those changes.

Davies (1987, p. 37) argues that accounts of classroom life by teachers have "an enormous impact on other teachers - particularly if the personal tone is retained, if the process is described 'warts 'n all', and if there are few pedantic assertions about what other people could do in the classroom". Thorne (1990, p. 84) also notes that while action research is more a strategy of evaluation than a model, it is being regarded widely as a model due to its widespread use and credibility. In addition, he suggests that the collection and processing of data inherent in Stake's evaluation model could be the basis for the observation and reflection stages in the action research process. Thorne concludes that:

"... it seems reasonable to accept that the action research method now has a distinct place in evaluation practice and therefore the process can be examined as an entity along with models of evaluation." (Thorne, 1990, p. 84)

A more recent term and approach is that referred to as action evaluation which is:

"a process in which the 'practitioners' are included as evaluators, which features collaborative planning and data-gathering, self-reflection and responsiveness, and which embodies a substantial element of professional development. 'Ownership' of the evaluation is vested in the 'practitioners'." (Batchler, 1984, p. 15)

According to Batchler and Maxwell (1987, p. 70), action evaluation "aims primarily to bring about improvement in educational programs in an ongoing fashion". Moreover, due to its emphasis on professional development, action evaluation also aims to produce change in participants. They indicate that there are similarities between action research and action evaluation since they share seminal writings on action research. However, Batchler and Maxwell (1987, p. 73) suggest that action evaluation draws upon evaluation literature. The similarities are that both have improvement in context as their purpose, both intend professional development as an outcome, both use facilitators to ease along the processes
of discussion, reflection, and action, and both are demanding of teacher time and energy. They also indicate that participation is a feature of both and the participants own the process.

However, while there are similarities, Batchler and Maxwell (1987, p. 74) point out that there are differences. They suggest that action research tends to have the classroom as the focus, while action evaluation has the school as the focus with less emphasis upon a particular classroom. They state that:

"The characteristics of action evaluation make it an appropriate change-producing activity in schools. Through its evaluative emphasis it leads to informed action aimed at improving schools' programs, but also, through its professional development thrust, it leaves behind expertise and changed attitudes enabling teachers to conduct their own evaluations. Given the context within which it must function, it is much more suitable as an improvement procedure than any external 'white coat' approach to evaluation." (Batchler and Maxwell, 1987, p. 76)

Through action evaluation operating at the whole school level, they indicate that the dialogue amongst teachers may produce something new to them. Negotiation becomes paramount, for Batchler and Maxwell, in action evaluation, as the purpose is for improvement of the whole school, not only the improvement through more effective individual classroom practices but also through school structures. Similarly, the 4GE principle of negotiations with stakeholders is important in this study "as a means to empowerment, both because of its process aspects and because it shares information (which is itself power)" (Guba and Lincoln, 1989).

### 3.6 Naturalistic and Participant-Oriented Approaches

Worthen and Sanders (1988, pp. 127-128) indicate that beginning as far back as 1967, some evaluation theorists began reacting to the dominance of what they considered to be mechanistic, insensitive approaches to educational evaluation. These theorists expressed concerns that many large-scale evaluations were conducted without the evaluators ever setting foot in the participating classrooms. Moreover, they began to publicly question whether many evaluators really understood the phenomena that existed behind
writings (e.g. Worthen and Sanders, 1988) that value pluralism needed to be accommodated and protected. In particular, multiple, rather than single, realities needed to be recorded. As Worthen and Sanders (1988, p. 130) suggest, people see things and interpret them in different ways, and no one perspective is accepted as the truth. Thus, because only an individual knows what he or she has experienced, then all perspectives are accepted as correct. The evaluator’s task then is to capture these multiple realities of the participants. Therefore, in evaluating the QSC, it is important for that evaluation to include the teachers and the students in the process. In addition, school-level administrators (i.e. Principals, Deputy Principals, Registrars and Heads of Departments) and the parents also need to be included in that process.

In providing a summary and comparative analysis of alternative evaluation approaches, Worthen and Sanders (1988, pp. 144-159) outline features of each of the approaches presented in their classification schema. Naturalistic and participant-oriented approaches are summarised on the following page in Table 3.2 which is an adaptation of Worthen and Sanders (1988) classification. The purpose, distinguishing characteristics, and contributions to the conceptualisation of an evaluation relate closely to the principles of 4GE models outlined earlier in this chapter. Moreover, the aims of this study are congruent with the purpose of the evaluation outlined in their summary - that is, to understand and portray the complexities of the QSC and respond to an audience’s requirements for information.

3.7 Fourth Generation Evaluation (4GE)

3.7.1 The Generation Metaphor and Approach

Guba and Lincoln (1989) have described successive generations of evaluation leading to a constructivist form of evaluation which they refer to as fourth generation evaluation. Caulley (1989), in providing an account of the four generations of evaluation, suggests that this process is similar to the development of the hand calculator in that the basic concept remains the same but as each of the generations appear there is a refinement of features and
Table 3.2: Stakeholder Focus in Evaluation Conceptualization

This updates and extends the previous summary of naturalistic and participant-oriented approaches by Worthen and Sanders, 1988, pp. 152-155)

| Proponents | Stake Patton Guba and Lincoln Rippey  
| Macdonald Parlett and Hamilton |

Understanding and portraying the complexities of an educational activity, responding to an audience’s requirements for information.

Reflecting multiple realities, use of inductive reasoning and discovery, firsthand experience on site.

Examination of innovations and change about which little is known, ethnographies of operating programs.

Emergent evaluation designs; use of inductive reasoning; recognition of multiple realities; importance of studying context; criteria for judging the rigour of naturalistic inquiry.

Credibility, fit, auditability, confirmability.

Focus on description and judgment, concern with context, openness to evolve evaluation plan, pluralistic, use of inductive reasoning, use of a wide variety of information, emphasis on understanding, empowers stakeholders.

Nondirective, tendency to be attracted by the bizarre or atypical, potentially high labor intensity and cost, hypothesis generating, potential for failure to reach closure.

Continuing negotiations with all stakeholders to determine the focus, the procedures, the interpretations and the proposals for action that guide the evaluation activity.

Models. According to Guba and Lincoln (1989), the initial generation was reflected by the proliferation of tests which were used to determine the status of individuals or groups as compared to pre-defined scores. Thus, the evaluator performed a functional role of developing, administering, scoring, and interpreting test results. In the second generation, Guba and Lincoln noted that the evaluator began to describe differences in terms of the strengths and weaknesses of an individual or group in comparison to defined objectives. It's indicated earlier in this chapter, critics in the 1960's drew attention to deficiencies of
Second generation evaluation; in particular, the lack of judgment. Judgment became an
integral feature of third generation evaluation. In fourth generation evaluation, as outlined by
Guba and Lincoln (1989), all evaluation activities occur through continuing negotiations
with the relevant stakeholders and the method is consistent with the paradigm of
constructivist inquiry. McEvoy and Rissel (1992) indicate that:

"The role of the evaluator is radically changed. No longer is the evaluator the independent
evaluator, technician or leader; rather the evaluator acts as a mediator and facilitates negotiation
amongst stakeholders, surrendering the obtrusive investigator role and becoming a simultane­
ous teacher and learner. As the evaluator is a mutual participant in the evaluation process, he/she
has no avenue for claiming neutrality or objectivity or cozy relations with the program
managers. The evaluator honours value pluralism and the respondents as a group fully and
continually collaborate in the identification of claims, concerns and issues, in the collection and
analysis of data and in decisions to take action. Thus, fourth generation evaluation theoretically
comes to be both the process and the product." (McEvoy and Rissel, 1992, p. 25)

Importantly, McEvoy and Rissel (1992, p. 26) argue that the principles inherent in the
constructivist paradigm foster the empowerment of the participants and should ultimately
mean that the evaluation findings may be more broadly useful. Furthermore, through the
model's collaborative approach, accountability for the evaluation results is shared and
subsequent action becomes shared rather than assigned. Similarly, Russell and Willinsky
(1995, p. 3) argue that 4GE, through having particular relevance for developing alternative
formulations of evaluation practices, "can add a richness to accounts of student learning,
and increase the likelihood of the evaluation actually being used to improve teaching in the
school".

McEvoy and Rissel (1992, p. 25) also indicate that the objectives, methods and instruments
are chosen by group consensus and thus the dominance of managerialism theoretically
becomes obsolete. They provide a diagram, presented in Figure 3.6, which illustrates the
process whereby decisions regarding methodology are made. A variety of different
methods are available in 4GE including group discussion, collaborative inquiry, as well as
quantitative methods. McEvoy and Rissel (1992) indicate that Svenson (1991) claims that
observational interviews is the backbone of this approach as its object is to "step inside the
mind of the respondent stakeholder and discover their particular feeling, thoughts and
constructions" (McEvoy and Rissel, 1992, pp. 25-26).
Figure 3.6: Steps outlining the process of fourth generation evaluation* (Source: McEvoy and Rissel, 1992)* Adapted from Guba and Lincoln (1989) and Rissel (1991)

In terms of this study, Stake’s ‘clock’ as depicted earlier in Figure 3.4 provided a guide for formulating the steps in the program evaluation process. From a review of the literature relating to evaluation models, a need to establish a new model was realised. Together with the steps used in 4GE models identified by McEvoy and Rissel (1992) and displayed in Figure 3.6, the steps used in this study are presented in Figure 3.7 on the following page in a diagrammatic manner similar to Stake’s ‘clock’.

2.7.2 Fourth Generation Evaluation - A Critique

In recent years, 4GE has become the focus for critical analysis and debate (Sechrest, 1992; Fishman, 1992) and further clarification by Lincoln and Guba (1992) following Guba and Lincoln’s proposed concept of 4GE (1989, 1990). For example, Fishman (1992) argues that the main focus of Guba and Lincoln’s (1989) book on 4GE is an “argument to replace traditional evaluation with ‘fourth generation evaluation’; which is based on the post-modernistic epistemology of constructivism” (Fishman, 1992, p. 263). According to
Figure 3.7 Steps Outlining the Program Evaluation Process for this Study

Fishman (1992), the heart of the issue is that:

"In polar contrast to positivism's assumption that the 'true' nature of external reality is discoverable through the scientific method, constructivism assumes that there are only alternative, subjective constructions of reality produced by different individuals. Therefore, instead of the positivist role of measuring a program's goal attainment in scientific, quantitative ways, the role of the program evaluator becomes one of facilitating interpretive dialogue among a wide variety of a program's stakeholders." (Fishman, 1992, p. 263)

Similarly, Sechrest (1992, p. 1) in a scathing attack titled Roots: Back to Our First Generations highly critical of the generational metaphor as it is "bothersome". He argues that:

"The first thing that bothers me about the generational metaphor is the image, the implication, of earlier generations being replaced by later ones in a sort of inevitable progression. The first, second, and third generations? Away with them! They are tiresome, garrulous, and soak up too many scarce resources!... The Fourth Generation does mean to replace what it sees as the preceding three." (Sechrest, 1992, pp. 1-2)
rather "It expounds a philosophy - ontology, epistemology, and ethics - to substitute for the philosophy that has been our foundation in the past". In response to Sechrest's (1992) attack, Lincoln and Guba (1992) directly addressed the criticisms in their paper titled In response to Lee Sechrest's 1991 AEA Presidential Address: "Roots: Back to our First Generations". They indicated that they were "astonished and dismayed" by Sechrest's (1992) paper:

"We were astonished because of the misunderstandings and misinterpretations of our book, Fourth Generation Evaluation...that Professor Sechrest's paper evidences, and dismayed, because of the animosity he displays. His is less an attempt to provide criticism than to demolish." (Lincoln and Guba, 1992, p. 165)

Through this critical debate and interplay of ideas, 4GE becomes clarified by Lincoln and Guba (1992, pp. 165-169). Specifically in relation to methods, they refute Sechrest's suggestion that they "aim to replace all quantitative methods with qualitative ones" and they state that:

"We have never so argued, and certainly not in 4GE. It has always been our position that both quantitative and qualitative methods are appropriate to any paradigm, including the constructivist paradigm that undergirds 4GE; it is only their relative emphasis that is likely to differ." (Lincoln and Guba, 1992, p. 166)

Lincoln and Guba (1992, p. 167) proceed to highlight that their position is that, through a process of negotiations with the various stakeholders, whatever emerges as the problems, concerns, and issues should be the basis for the evaluation, and "not the criteria, and certainly not the methods, that the evaluator...brings to the evaluation" (Lincoln and Guba, 1992, p. 167). Thus, according to the spirit of 4GE, the criteria and methods must be negotiated.

Fishman (1992), in his critique of 4GE, discusses the practical paradigm which he develops by incorporating many of the ideas of third generation evaluation into a constructivist epistemology (Fishman and Neigher, 1987; Fishman, 1991a). Program evaluation undertaken within the pragmatic paradigm employs quantitative and conceptual elements from positivistic evaluation within a constructivist context "so that quantification is employed in the service of meeting the decision-makers' information needs" (Fishman, 1992, p. 269). Fishman argues that in developing that paradigm, he linked it to a variety of case studies (Fishman and Peterson, 1987; Fishman, 1991a, 1991b) to illustrate how the model describes and explains more or less successful evaluation projects. Fishman's purpose in discussing
The pragmatic paradigm is that the ultimate justification of any evaluation model within an instructivist methodology is in its pragmatic value in helping decision-makers and other stakeholders in particular case situations. Fishman (1992, p. 269) subsequently notes that, unfortunately, *Fourth Generation Evaluation* is lacking in such case study examples". Russell and Willinsky (1995, p. 18) also urge that "what is now needed are case studies of attempts by teachers and their school communities to use 4GE approaches...to see how the potential for improving teaching and learning...is realised". Similarly, Sechrest observed that:

"Interestingly, *The Fourth Generation Evaluation* (Guba and Lincoln, 1989) contains no examples whatsoever of fourth generation, or third-and-a-half level evaluations unless one counts a qualitative evaluation of a quantitative evaluation as such". (Sechrest, 1992, p. 4)

This evaluation represents a serious attempt to meet the challenge posed by Fishman (1992) in his critique of 4GE in which he noted that Guba and Lincoln could not provide "even one sample study...in enough detail to demonstrate in actuality the practical value of their model" (Fishman, 1992, p. 268). Furthermore, Fishman argued that, while he remained open to the possibility that 4GE could be successful, "the model must be demonstrated with detailed case examples" (Fishman, 1992, p. 269). In taking up that challenge in this thesis, the following analyses provide models from which features can be drawn to develop an evaluation framework for guiding this evaluation using 4GE principles.

**Summary**

Following the review of evaluation models and in particular, naturalistic and participant-observation and 4GE approaches, several models and approaches were described. Stake's maintenance Model and responsive evaluation were examined in terms of their implications for undertaking evaluation studies. Illuminative evaluation was subsequently described briefly to highlight Parlett and Hamilton's argument for evaluation studies to illuminate problems, issues, and significant program features. Action research and action evaluation were then discussed and similarities and differences between the two approaches were outlined. Collectively, these approaches together with the earlier analysis of evaluation models provide an essential context within which an evaluation model for
undertaking a program evaluation of the QSC can be developed. The development of that model is undertaken in the following section of this chapter.

3.9 Selecting and Formulating an Evaluation Model for Undertaking the Program evaluation of the Queensland Sunrise Centre

In undertaking the process of selecting and formulating a model to evaluate the QSC project, two key options were identified. The first option required a search to locate a model which had been used elsewhere in evaluating learning technology initiatives and could subsequently be used again without the need for modifications. Alternatively, a model would be developed to suit the purpose of this evaluation. The first option was considered by the QSC stakeholders and a discussion of the reasons for not adopting it follows. The second option was selected and the formulation of the model to be used for this study is described.

3.9.1 The First Option - Locating an Evaluation Model

Investigations into locating a model used elsewhere for evaluating learning technology initiatives revealed a plethora of papers, journal articles, and books dealing with computers in schools. However, a search for evaluation studies of those initiatives revealed a lack of comprehensive evaluations of technology initiatives in schools which were based upon many evaluation models. For example, in Queensland, three prominent evaluation studies undertaken - *Microcomputers in Queensland Preschools A Study* (Blemings, 1988), *Business Education Centres in Queensland State High Schools: Context and Change* (Department of Education, Queensland, 1990c) and the report of the *Learning Systems Project* (Queensland Treasury Department and Department of Education, 1991) did not apply models found in the evaluation literature.

In describing the research design to *Microcomputers in Queensland Preschools A Study*, Blemings (1988) indicated the use of naturalistic research and used a variety of data
gathering techniques - interviews, teacher diaries, structured logs, software usage check-
lists, software observation schedules, questions for parents, questions for teachers, and
teacher ratings of software, to gain an "understanding of complex realities" (Blemings, 1988,
5). Similarly, the report Business Education Centres in Queensland State High Schools: School
Context and Change (Department of Education, Queensland, 1990c) utilised a qualitative
research method to gather information for that report and viewed "inquiry as an interactive
process between the researcher and the participants". That report indicated that "such
research is largely descriptive and relies on people's impressions for the primary data"
(Department of Education, Queensland, 1990c). However, no indications of 4GE principles
being employed to guide the studies were evident. Indeed, neither presented a model
drawn from the evaluation literature that could be used as a basis for this study.

The report of the Learning Systems Project (Queensland Treasury Department and Depart-
ment of Education, 1991) used an evaluation process which consisted of a review of relevant
documents, interviews, and observations within Central Office, Regional Offices, and
selected schools. In addition, surveys were conducted. That report indicated that it did not
attempt to establish empirical relationships between learning technology and learning
outcomes. It noted that support for adopting observation and interview methods was
provided by Kinnick et al (1990) in their paper arguing for the need for a new framework
for evaluating computer technology innovation in schools. Again, no comprehensive
framework was identified in that evaluation which could directly assist in undertaking the
QSC school-based evaluation.

A wider search of the literature dealing with the evaluation of learning technology
initiatives in schools provided evidence of some evaluative studies - for example, Explora-
tory Studies in Educational Computing in New Zealand (McMahon, 1986), Computers, Children
and Classrooms: A Multisite Evaluation of the Creative Use of Microcomputers by Elementary
School Children (Carmichael et al, 1985), and An Evaluation of a Project for Preparing Science
Teachers to Use Microcomputers (Ellis, 1989). Each of those studies indicate the research
methodology employed but, like the Queensland studies cited earlier, a suitable model was
not presented that could be used as a basis for this study. Indeed, Mojkowski (1985, p. 20)
described that “despite all of the activity to date, comprehensive evaluations of computer programs are in short supply”.

For example, at the Australian Computers in Education Conference (1992), of more than eighty papers presented, those which referred to studies in educational computing in schools provided examples of various research procedures - for instance, an empirical study of problem solving and adventure games (Curtis, 1992), case studies of learning in computing contexts (McDougall, 1992; Lau, 1992), an examination of where Logo research is heading (Au, 1992), action research (Hallet and Macfarlane, 1992), research related to projects (Nadebaum, 1992; Pacey, 1992), and longitudinal studies (McKinnon et al, 1992). However, none of the papers presented effectively outlined a model, drawn from the evaluation literature and involving stakeholders as active participants, for use in evaluating technology initiatives in schools. Following the unfruitful search for evaluation models used elsewhere in educational computing studies in Queensland, nationally, and internationally, it was decided that the first option of using a model used before was not viable.

3.9.2 The Second Option - Developing an Evaluation Model

The major purpose of this study was to provide a program evaluation of the QSC Project because of the priorities of the Department of Education in Queensland relating to the integration of learning technology in schools. As such, it aimed to provide information and analysis about that project by focusing on situational analysis, project management, and the impact of the project. Essential to the study was the identification of, negotiation with, and involvement of the key people in the program in the evaluation process. Ownership, involvement and credibility with the participants in the project were central concerns.

Fiske’s Countenance Model offers ideas for an initial framework for questions to be asked about rationale, intents, actual events, and standards. That model reminds us that full descriptions of the actual object of the evaluation and the context in which it operates would be included in our evaluation (Worthen and Sanders, 1988, p. 214). Moreover, his notion of responsive evaluation emphasises that the ultimate test of the validity of an evaluation is the extent to which it increases the audience’s understanding of the educa-
The examination of developments in evaluation together with the presentation of the various evaluation models which have emerged provided a summary of the different approaches to evaluation. More recently, Owen (1992) has argued that what is needed is a framework based on the concept of evaluation Form for providing guidelines for choosing an evaluation approach. Owen provides a framework which he suggests is not a 'higher' model than those developed by the key evaluation theorists, but that his framework helps in "flexibly selecting and using the most appropriate approach" (Owen, 1992, p. 78.1).

Owen's framework is built on the concept of Form which he suggests consists of five dimensions which

"...give conceptual and practical guidance in determining the most appropriate approach to program evaluation for a given situation. Decisions based on Form are a prerequisite for action in any field work, that is, Form should be used in the planning stage of an evaluation (An evaluation can be thought of as having three stages; (i) planning, (ii) obtaining, and (iii) disseminating). Experience has shown that, if planning takes into account the concept of Form, the evaluation will be more clearly focussed and has a high likelihood of impacting on decision making concerning the program under review." (Owen, 1992, p. 78.1)

Five major Forms are identified by Owen. These are impact evaluation, monitoring evaluation, process evaluation, design evaluation, and evaluation for development. Owen discusses each of these Forms according to the dimensions of orientation (i.e. the fundamental reason for undertaking the evaluation), state of the program (i.e. the degree to which the program under review has been implemented at the time of the proposed evaluation), focus (i.e. the component/s upon which the evaluation is likely to be concentrated), timing (i.e. the temporal link between the evaluation and the program delivery), and evaluation approach. Owen (1992, p. 78.2) indicates that it is possible that an approach might be chosen which uses either a single Form or uses a design which is based on more than one of the Forms. Owen's evaluation Forms are presented in Figure 3.8.

The evaluation Forms which most closely relate to this study are process evaluation and impact evaluation. The evaluation relates to process evaluation because it aims to:

* gain information about the QSC activities,
* assist those involved in the project to examine effective learning and teaching practices
e.g. teachers using action research,
* assist those associated with the QSC Project and with the various audiences of the study
to more fully understand how and why the project operates; e.g. Stake's responsive
evaluation and Parlett and Hamilton's illuminative evaluation.

The focus on process evaluation also allows for the evaluation to be conducted from within
a constructivist paradigm and avoid the dangers of a reductionist model. The study also
relates to **impact evaluation** as the evaluation seeks to provide information related to
questions and concerns about project impact. Those questions and concerns were formu-
lated by the key participants in the project; e.g. in what ways have the students been
dantaged and/or disadvantaged by being involved in the project? Therefore, the
approach most appropriate for undertaking this evaluation represents a balanced combi-
nation of two of the evaluation Forms - **process evaluation** and **impact evaluation**.

![Figure 3.8: Evaluation Forms](Source: Owen, 1992, p. 78.6)

<table>
<thead>
<tr>
<th>DIMENSION</th>
<th>Form Five</th>
<th>Form Four</th>
<th>Form Three</th>
<th>Form Two</th>
<th>Form One</th>
</tr>
</thead>
<tbody>
<tr>
<td>EVALUATION FORM</td>
<td>EVALUATION FOR DEVELOPMENT</td>
<td>DESIGN EVALUATION</td>
<td>PROCESS EVALUATION</td>
<td>MONITORING EVALUATION</td>
<td>IMPACT EVALUATION</td>
</tr>
<tr>
<td>ORIENTATION</td>
<td>SYNTHESIS</td>
<td>CLARIFICATION</td>
<td>IMPROVEMENT</td>
<td>ACCOUNTABILITY</td>
<td>JUSTIFICATION</td>
</tr>
<tr>
<td>STATE OF PROGRAM</td>
<td>NONE</td>
<td>DEVELOPMENT</td>
<td>DEVELOPMENT</td>
<td>SETTLED</td>
<td>SETTLED</td>
</tr>
<tr>
<td>FOCUS</td>
<td>CONTEXT</td>
<td>DESIGN</td>
<td>DELIVERY</td>
<td>OUTCOMES/ DELIVERY</td>
<td>OUTCOMES/ DELIVERY</td>
</tr>
<tr>
<td>TIMING</td>
<td>BEFORE</td>
<td>DURING</td>
<td>DURING</td>
<td>DURING</td>
<td>AFTER</td>
</tr>
<tr>
<td>TYPICAL APPROACHES</td>
<td>NEEDS ASSESSMENT</td>
<td>EVALUABILITY ASSESSMENT</td>
<td>ACTION RESEARCH</td>
<td>RAPID RESPONSE</td>
<td>OBJECTIVE BASED SYSTEMS</td>
</tr>
<tr>
<td></td>
<td>REVIEW OF PRACTICE</td>
<td>RESEARCH</td>
<td>ILLUMINATIVE RESPONSIVE</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>RESEARCH SYNTHESIS</td>
<td>ACCREDITATION</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Figure 3.8: Evaluation Forms** (Source: Owen, 1992, p. 78.6)
Having used these guidelines for choosing an appropriate methodology, a model for guiding the QSC program evaluation can be more effectively developed. Batchler (1982a, 8) indicated that "in order to accommodate the wide variety of projects, we need a model general enough to allow for both a broad range of input data and for adaptations to particular requirements". Batchler suggested a modification of Stake's model which he claims is general enough to embody elements of both goal and systems models. That model is shown below in Figure 3.9.

**Figure 3.9: A Framework to Guide Evaluation and Reporting**
(Source: Batchler, 1982a, p.8)

Each of these cells are briefly described under two major organising headings - What Was Intended and What Happened. In the What Was Intended cells, intended resources refer to the kinds of people, equipment and other resources needed to be used in the project. In addition, this cell requires a description of the children involved. Intended processes refer to the procedures to be implemented and describes what the project intended to do. Intended results refer to what was intended to happen as a result of the project. Batchler (1982a, p. 9) suggests that results are often tied closely to the intended processes.
the What Happened cells, the concern is with what actually happened as the project was implemented. As well as finding ways of describing what occurs as guided by the intentions part of the model, attempts should be made to note unanticipated effects as well (Batchler, 1982a, p. 9). The actual resources cell requires a description of the characteristics of the students involved in the project and an 'inventory' of resources (e.g. equipment, people, etc) actually present for use in the project. The actual processes refers to efforts to describe what occurred. The actual results relates to what happened. Batchler (1982a, pp. 10) indicates that in some projects, results will be easy to measure, while in other projects this will be much more difficult. According to Batchler, this is a function of the degree of precision with which what was intended to happen was specified.

There are four main steps in processing the information obtained through employing the framework devised by Batchler (1982a, p. 10). Firstly, the relationships among resources, processes and results from the What Was Intended column are examined. Secondly, the relationships among resources, processes, and results in the What Happened column are discussed. Thirdly, the degree to which the resources, processes, and results cells in the What Happened column match the resources, processes, and results cells in the What Was Intended column are analysed. Fourthly, judgments are made about the merit of the project based on the information and discussion undertaken in the first three steps. The first two steps equate to Stake's contingencies contained in his Countenance Model (see Figure 3.4), while the third step reflects his notion of congruence. The fourth step involves judgments which in Stake's Countenance Model is evident in the judgments and standards columns.

Norme (1990, p. 94) reported that the model devised by Batchler had been used successfully with many programs in Australia through a National Project which evaluated programs for severely handicapped children (Batchler, 1982b); e.g.

- Basic Sensory Stimulations for the Severely Handicapped (at Windsor),
- Develop, Implement, Evaluate, Disseminate Curricula for Severely Handicapped Children (at Sunbury), and
- Mobility, relaxation and exercise through hydro-therapy (at Echuca).
Thorne, in undertaking an evaluation of the parent segment in early special education programs in a selection of schools in Tasmania, augmented the Batchler adaptation by including a facility to compare the program being evaluated with agreed and/or desired standards. While not evaluating learning technology initiatives, the model provides a basis for the development of a model for this study. That model which Thorne called the Augmented Stake-Batchler Model is presented below in Figure 3.10.

![Augmented Stake-Batchler Model](image)

**Identify, negotiate with and involve key people in the program in the evaluation process.**

**PROGRAM RATIONALE:**

**WHAT WAS INTENDED**
- What we needed.
  - people
  - equipment
  - money
  - training
- What we intended to do.
- What we intended to happen.

**WHAT HAPPENED**
- What we had.
  - people
  - equipment
  - money
  - training
- What we did.
- What actually happened.

**STANDARDS**
- Acceptable levels of
  - people
  - equipment
  - money
  - training
- Recommended activities.
- Reasonable short and long term results.

**REVIEW** the utilization effectiveness of the evaluation process.

*Figure 3.10: Augmented Stake-Batchler Model*
*Source: Thorne, 1990, p. 95*
seen as a major step in a series of negotiations with significant people that should lead to quality programs. A persistent theme advocated by Thorne was "the need to plan effectively for the eventual utilization of the evaluation" (Thorne, 1990, p. 97). Thorne notes that:

"The idea of utilization, whereby a specific audience is identified and involved from the outset in negotiation, design, analysis, focus, interpretation and dissemination, is a key feature of action research. If this audience includes significant members of the program staff... then it will be a sound foundation for effective communication, a sense of ownership of the evaluation activity and the credibility of the evaluation. The base model then could take on the strongest features from Stake, and action research." (Thorne, 1990, pp. 89-90)

"By the features derived from Stake and action research, this study also draws upon some features of action evaluation through its involvement of the 'practitioners' as evaluators through collaborative planning, data-gathering, self-reflection and responsiveness. Furthermore, it can be described as an illuminative evaluation in order to illuminate problems, issues, and significant features of the program. In developing the model, as displayed in figure 3.11 on the following page, for the evaluation being undertaken of the QSC, features these are used to develop a further modification of the Augmented Stake-Batchler Model formulated by Thorne. As Owen (1992) has suggested, it is important for an evaluation to identify the design of the evaluation which is appropriate for the program being evaluated. For example, it might be that another evaluation activity is undertaken of an initiative which required monitoring evaluation for accountability purposes. It would be essential that context that an approach to that evaluation was based around an evaluation Form evaluation Forms which reflected the orientation, state, focus, and timing aspects of that program. In addition, the evaluation Forms (Owen, 1992) of process evaluation and impact evaluation determined to be the appropriate approach for this evaluation are included in the model. Both of these are highlighted in the section of the model which focuses on choosing an appropriate evaluation Form. All of the five Forms are included in the model the model developed might be used as the basis for the evaluation of other learning technology initiatives. Thus, Owen's framework has been included in the model to assist guiding the selection of an appropriate Form."
Identify, negotiate with and involve key people in the program in the evaluation process. Identify the research questions.

**PROJECT RATIONALE:**

**PROJECT SYNTHESIS**

*PROJECT RATIONALE*

None

Context

Before

**OCRAM EVALUATION**

*Description and Judgment*

**WHAT WAS INTENDED**

Situational Analysis*

Project Management*

Impact of the Project*

**WHAT HAPPENED**

Situational Analysis*

Project Management*

Impact of the Project*

**RESOURCES**

What we needed.

- people
- equipment
- budget
- training

What we had.

- people
- equipment
- budget
- training

**PROCESSES**

What we intended to do.

What we actually happened.

**RESULTS**

What we intended to happen.

**APPRAISAL OF THE MODEL FOR PROGRAM EVALUATION**

Figure 3.11: The Model for Guiding the Program Evaluation of the Queensland Sunrise Centre Project

Theoretical Background in Evaluation
The model formulated to guide the program evaluation of the QSC Project, presented in Figure 3.11, indicates the importance of identifying, negotiating with and involving key people in the evaluation. Moreover, the key participants (i.e. the QSC teachers) are involved early in the evaluation process and they play an important role in identifying the evaluation questions. The evaluation headings - Situational Analysis, Project Management, and Impact of the Project to which the evaluation questions relate provide key headings in the model. Both description and judgment, which Stake (1967, p. 525) insists are the two basic acts of evaluation are included. The cells in the columns What Was Intended and What Happened are retained from Stake (1967), Batchler (1982), and Thorne (1990) to provide a framework for describing and judging the QSC Project. Resources, processes, and results are included in that section of the model.

As the QSC Project was established as an investigative activity to explore ways to enhance and extend learning for students immersed in a technologically-rich classroom environment, it is difficult if not impossible to negotiate standards from previous research or other programs due to the innovative nature of the project. Thus, the augmented dimension relating to 'standards' has been modified to highlight the identification of issues emerging from the evaluation. That also reflects the process evaluation Form of this study in that the state of the project relates predominantly to development, the timing is during the project, and the study can provide information and assist in project improvement. As a consequence of that process, findings and their implications can be discussed which will be credible with the participants and serve audience requirements for information.

At the same time, the QSC was in its third year of operation which constituted the final year for the first group of students in the project. Moreover, it was the final year of involvement for the teachers involved in the project at Coombabah State School. Therefore, there was the need expressed by stakeholders that information relating to impact evaluation should be gained. That is, the orientation is project justification, and the focus of the study relates to outcomes as well as delivery.
Appraisal of the Model for Program Evaluation

As indicated in the Model for Guiding the Program Evaluation of the Queensland Sunrise Centre Project (Figure 3.11), an appraisal of the model for program evaluation is included in that model. In appraising the model, the key participants were invited to evaluate the evaluation model. Questions related to the evaluation heading Appraisal of the Model for Program Evaluation were presented in Chapter One (see Table 1.2, p.5); i.e.

1. Appraisal of the Model for Program Evaluation

Was the model used suitable for evaluation of the Queensland Sunrise Project?

How effective was the model for identifying the key components of the Queensland Sunrise Project?

What contribution does the program evaluation make for program improvement?

As Worthen and Sanders (1988, p. 370) indicate, they are convinced of the importance of evaluation in educational improvement. In addition, they suggest that "Despite great strides, it is increasingly apparent how little we really know about evaluation, compared to what we need to know" (Worthen and Sanders, 1988, p. 400). Similarly, this evaluation is undertaken as an investigative activity as well as an evaluative endeavour. As such, it provides the opportunity for the evaluation of the evaluation itself in order to contribute to our knowledge about evaluative frameworks for use in investigating learning technology initiatives in schools.

The justification for the inclusion of these questions in an appraisal of the model for program evaluation of the QSC is substantiated by two main arguments. Firstly, the role of the participants throughout the evaluation is regarded as critical. Through the involvement of, and negotiations with participants, the evaluation gains credibility through its responsiveness. Furthermore, it can serve an educative, professional development function. In practice, this means that the evaluation process extends beyond the production of a final report. That is, the report itself will be the subject of evaluation. Participants will be invited to undertake a post-evaluation check strategy in which an appraisal of the model
be an important part of that strategy. Secondly, the model requires appraisal as one of the aims of this study is to assist in the development of evaluative frameworks for investigating learning technology initiatives in schools. Put succinctly, the model developed can provide the basis for future investigations aimed at evaluating learning technology initiatives in schools.

Included in that post evaluation check (see Appendix J) were additional questions about the utility, feasibility, propriety, and accuracy of the evaluation report. Those questions were formulated through adapting the Standards for Evaluations of Educational Programs, Projects, and Materials (Joint Committee on Standards for Educational Evaluation, 1981).

Conclusion

This chapter has presented a review of theoretical issues evident in the evaluation literature. Initially, evaluation and program evaluation were defined. Subsequently, an overview of developments in evaluation and an analysis of evaluation models were presented. Specifically, Stake's Countenance Model and his notion of responsive evaluation were then discussed. Illuminative evaluation, action research, and action evaluation were examined to provide essential background for facilitating the process of selecting and formulating a model to guide the QSC program evaluation. Following that analysis and discussion, naturalistic and participant-oriented and 4GE approaches were reviewed.

Two options were examined for formulating the model. The first option involved a search for a model which had been used elsewhere in evaluating learning technology initiatives and which had been derived from the evaluation literature. That search failed to locate any suitable models on which this study could be based. The second option was undertaken in which a model was developed after selecting a model from the evaluation literature, drawing upon various approaches, and modifying the model. The model developed emphasises 4GE methodology, particularly with stakeholder involvement, uses features from Stake's Countenance Model (1967) and his later work on responsive evaluation. It also
Theoretical Background in Evaluation

The model provides a framework for guiding this evaluation. It provides the basis for selecting and justifying the data to be collected. The research design is described in the next chapter.
CHAPTER FOUR

RESEARCH DESIGN

This chapter provides a description of the research design, its justification and implementation as used in this study. The focus of the research design was the implementation of an evaluative case study employing 4GE principles through the involvement of all relevant stakeholders. Once the 4GE approach had been identified as the basis of the evaluation of the QSC, all evaluation activities were then directed through continuing negotiations with the relevant stakeholders.

In this chapter, the study sample, the research methodology, the program evaluation data collection procedures employed, and the data collection instruments are outlined. The steps employed in undertaking this program evaluation are then presented. The overall reliability and validity of the study are examined in terms of the separate strategies employed for ensuring internal validity, reliability, and external validity of the different and varied aspects of the data collection. In addition, the issue of ethics involved in carrying out the study is addressed. Finally, the treatment of the data is discussed.

1. The Study Sample

The study sample is described in terms of the schools, the teachers and the students involved in the QSC. Two schools were chosen for the site of the QSC by the Department of Education, Queensland in late 1989. Those schools were Coombabah State School and Coombabah State High School. This study focuses on the students and teachers who were directly involved with the project within those schools. Site descriptions were undertaken of both of those two schools using situational analysis principles (Marsh and Stafford, 1992, pp. 107-110) in May, 1992 to enable the following contextual features of them to be identified.
4.1.1 The Schools

Coombabah State School and Coombabah State High School are located in the South Coast Region of the Department of Education, Queensland (Appendix C). The schools are in close proximity to each other in the northern suburbs of the Gold Coast. Coombabah State School and Coombabah State High School draw their student populations from a range of socioeconomic conditions. Housing and accommodation ranges from caravans to valuable homes and units. Residential areas near both schools include several caravan parks, townhouse and unit developments, single dwelling residences, canal front homes, valuable island homes, and high rise units. Some of the island homes and high-rise penthouses are worth in excess of a million dollars.

4.1.2 Coombabah State School

Coombabah State School, located on Oxley Drive, Paradise Point, opened in 1981. The school’s population has increased to a current enrolment which is in excess of 820 primary students and approximately 80 children in a double unit preschool. The primary enrolment which stabilised throughout the period 1990-93 after quite rapid growth in the earlier years has shown substantial growth throughout 1993-94 and, as displayed in Table 4.1 on the following page, demographic projections by Facilities Development Branch (Sept. 1994, p.2) has predicted further growth in enrolment to almost 1100 students by the year 2000.

The school staff consisted of a Principal, 2 Deputy Principals, Registrar, Teacher in Charge Preschool, 27 Classroom Teachers, Teacher Librarian, Physical Education Specialist, Music Specialist, Learning Support Teacher, Administration Officer, Teacher Aides, Administrative Assistance Enhancement Program Casual Employee, Janitor/Groundsperson, and Cleaners. The school architecture is mostly characterised by multiple area classrooms with withdrawal rooms. The school’s computer resources were greatly enhanced by the resources allocated through the QSC Project. Actual computer holdings increased from 10 computers at the end of 1989 to more than 130 during 1991-92.
Table 4.1 Enrolment History and Forecast - Coombabah State School 1990 - 2000

<table>
<thead>
<tr>
<th>Year</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990a*</td>
<td>106</td>
<td>112</td>
<td>92</td>
<td>78</td>
<td>109</td>
<td>116</td>
<td>98</td>
<td>711</td>
</tr>
<tr>
<td>1991a</td>
<td>95</td>
<td>114</td>
<td>105</td>
<td>98</td>
<td>67</td>
<td>111</td>
<td>117</td>
<td>707</td>
</tr>
<tr>
<td>1992a</td>
<td>95</td>
<td>89</td>
<td>114</td>
<td>122</td>
<td>101</td>
<td>77</td>
<td>112</td>
<td>710</td>
</tr>
<tr>
<td>1993a</td>
<td>104</td>
<td>84</td>
<td>99</td>
<td>121</td>
<td>119</td>
<td>100</td>
<td>89</td>
<td>716</td>
</tr>
<tr>
<td>1994a</td>
<td>108</td>
<td>109</td>
<td>93</td>
<td>102</td>
<td>131</td>
<td>139</td>
<td>114</td>
<td>796</td>
</tr>
<tr>
<td>1995f **</td>
<td>119</td>
<td>117</td>
<td>119</td>
<td>104</td>
<td>118</td>
<td>146</td>
<td>152</td>
<td>875</td>
</tr>
<tr>
<td>1996f</td>
<td>126</td>
<td>127</td>
<td>125</td>
<td>123</td>
<td>112</td>
<td>131</td>
<td>158</td>
<td>902</td>
</tr>
<tr>
<td>1997f</td>
<td>134</td>
<td>133</td>
<td>135</td>
<td>129</td>
<td>130</td>
<td>124</td>
<td>142</td>
<td>927</td>
</tr>
<tr>
<td>1998f</td>
<td>141</td>
<td>142</td>
<td>141</td>
<td>139</td>
<td>137</td>
<td>141</td>
<td>134</td>
<td>975</td>
</tr>
<tr>
<td>1999f</td>
<td>148</td>
<td>149</td>
<td>150</td>
<td>145</td>
<td>147</td>
<td>148</td>
<td>151</td>
<td>1038</td>
</tr>
<tr>
<td>2000f</td>
<td>156</td>
<td>156</td>
<td>157</td>
<td>154</td>
<td>153</td>
<td>158</td>
<td>158</td>
<td>1092</td>
</tr>
</tbody>
</table>

* a - actual
** f - forecast
(Source: Facilities Development Branch, Department of Education, Queensland, Sept. 1994)

4.1.1b Coombabah State High School

Coombabah State High School is located on Pine Ridge Road, Coombabah. It opened in 1986 with an initial intake of Year 8 students. The student population grew rapidly with the school's enrolment peaking at 1566 students in both 1989 and 1990. The enrolment in May, 1992 was 1352 students. Coombabah State High School is a Band 11 school which is the highest banding of schools in Queensland. Band 11 schools are commonly regarded as super schools' due to their large enrolments. The staff of the school is correspondingly large with 123 staff (including teaching and non-teaching staff) employed at the school. The buildings are sited on 11.5 hectares of grounds and the buildings are relatively modern as the school is less than 7 years old. According to the school's administration, the computer resources in the school were considered by them to be better than in many schools.

4.1.2 The Teachers and the Students

The study focuses on the QSC classes within those schools. An overview of the participants in the project during 1992 is presented in Table 4.2 on the following page. The study sample involved 2 teachers and approximately 60 Year 7 students at Coombabah State School and approximately 60 Year 8 students and their teachers at Coombabah State High School.
Table 4.2: Overview of the Participants in the Queensland Sunrise Project 1990 - 1993

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>First group of students</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1990 - 1992</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>60 Year 6 students</td>
<td>60 Year 7 students</td>
<td>60 Year 8 students</td>
<td></td>
</tr>
<tr>
<td>Students:</td>
<td>at Coombabah State School</td>
<td>at Coombabah State School</td>
<td>at Coombabah State High School</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>60 Year 7 students</td>
<td>60 Year 8 students</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>at Coombabah State School</td>
<td>at Coombabah State High School</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>60 Year 6 students</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>at Coombabah State School</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3 Teachers at Coombabah State School</td>
<td>5 Teachers at Coombabah State School</td>
<td>2 Teachers at Coombabah State School</td>
<td>4-5 Secondary Teachers and Subject Teachers at Coombabah State High School</td>
</tr>
<tr>
<td>Teachers:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4.2 Research Methodology

The key research methodology chosen for this study is by case study. While the literature is replete with references to case studies, Lancy (1993, p. 140) agrees with Lincoln and Guba’s assertion that “there seems to be little agreement about what a case study is” (Lincoln and Guba, 1985, p. 360). Similarly, Merriam (1988) warns that “material on case study as a research strategy can be found everywhere and nowhere”. Ironically, in spite of that caution, Merriam has been a prolific writer about case studies and provides clarification through defining case studies. Consequently, case study research in the context of this study is defined from a naturalistic research paradigm as outlined by Merriam because: “research focused on discovery, insight, and understanding from the perspectives of those being studied offers the greatest promise of making significant contributions to the knowledge base and practice of education. Furthermore, most case studies in education are qualitative and hypothesis-generating, rather than quantitative and hypothesis-testing, studies.” (Merriam, 1988, p. 3)
Merriam (1988) examined several definitions proposed by several writers. For example, Wilson (1979, p. 448) defined the case study as a process "which tries to describe and analyze some entity in qualitative, complex and comprehensive terms not infrequently as it unfolds over a period of time". Moreover, Merriam noted that Macdonald and Walker's (1977, p. 31) definition of a case study as "the examination of an instance in action" is similar to Guba and Lincoln's (1981, p. 371) statement that the purpose of the case study is to "reveal the properties of the class to which the instance belongs". Merriam drew upon these definitions and then proceeded to further define the case study by its special features. Four characteristics which are considered by Merriam (1988, p. 11) as essential properties of a case study are that they are particularistic, descriptive, heuristic, and inductive.

According to Merriam (1988, pp. 11-13), particularistic means that case studies have a particular program, event, or phenomenon as their focus. Descriptive relates to the end product of a case study in which a rich, 'thick' description of the focus for the study is provided. Heuristic means that case studies aim to illuminate the audience's understanding of the phenomenon being studied. Finally, inductive means that, generally, case studies rely on inductive reasoning in which generalisations, concepts, or hypotheses emerge from the process of data examination. Consequently, Merriam defines case study as:

"...an intensive, holistic description and analysis of a single entity, phenomenon, or social unit. Case studies are particularistic, descriptive, and heuristic and rely on inductive reasoning in handling multiple data sources." (Merriam, 1988, p. 16)

Merriam's definition is adopted for the purposes of this study. The QSC program evaluation focuses on a particular project, aims to provide a full description of that project, attempts to illuminate the audience's understanding of it, and relies on inductive reasoning in dealing with emerging issues from the data collection.

42.1 Evaluative Case Studies

The end product of a case study "can be primarily descriptive, interpretive, or evaluative" (Merriam, 1988, p. 27). Merriam (1988, p. 28) indicates that evaluative case studies involve
description, explanation, and judgment. Similarly, Stenhouse (1988, p. 49) suggests that there are four broad styles of case study - ethnographic case study, evaluative case study, educational case study, and case study in action research. According to Stenhouse, the evaluative case studies, as either a single case or a collection of cases, are studies with the purpose of providing the educational actors or decision makers with information that will help them judge the merit and worth of policies and programs. As shown in the conceptualisation presented in Figure 4.1, an evaluative case study has been chosen as the strategy for focusing on the QSC.

**Case Studies**

**Properties of Case Studies (Merriam, 1988)**

<table>
<thead>
<tr>
<th>Particularistic</th>
<th>Descriptive</th>
<th>Heuristic</th>
<th>Inductive</th>
</tr>
</thead>
</table>

**Styles of Case Study (Stenhouse, 1988)**

- Ethnographic
- Evaluative
  - Program Evaluation of the QSC, involving description, explanation, and judgment
- Educational
- Action Research

**Figure 4.1 Conceptualisation of the Selection of Case Study Methodology**

The case study methodology in this evaluation required a process for undertaking the selection and analysis of data which was organised by The Model for Guiding the Program Evaluation of the Queensland Sunrise Centre Project (Figure 3.11, p.110) formulated earlier in this thesis and employed 4GE principles. Together with the Synthesis of the Literature Review and the Research Questions (see Table 2.2, p.74) which identified and justified the research questions, that model provided the basis for establishing the research design. Strategies were then implemented to enable the data collection procedures and the subsequent processing and reporting of the information to address the evaluation questions while being guided by the model developed. Thus, the case study was evaluative in its orientation.
Chapter Four

Program Evaluation Data Collection

This section discusses the choice of data collection procedures, provides an overview of the evaluation questions and the program evaluation data collection and validation, summarizes the procedures for the program evaluation, and finally presents an overview of the program evaluation timeline for this evaluative case study. The program evaluation data collection procedures were determined following consideration of what information was being sought and how that information would most appropriately be gained. For the purposes of this thesis, both quantitative and qualitative data were collected. Multiple methods of data collection were used and this was seen as a strength of case study methodology (Fetterman, 1988, p. 54). Case studies provide the opportunity to use multiple methods of data collection exceeding that in other research strategies, such as experiments, surveys, or histories.

"Experiments, for instance, are largely limited to the measurement and recording of actual behavior and generally do not include the systematic use of survey or verbal information. Surveys tend to be the opposite, emphasizing verbal information but not the measurement or recording of actual behavior. Finally, histories tend to be limited to events in the 'dead' past and therefore seldom have any contemporary sources of evidence, such as direct observations of a phenomenon or interviews with key actors". (Yin, 1984, p.90)

The methods of data collection used included situational analysis, questionnaires, interviews, classroom observations, samples of students' work, document perusal and analysis, and notes compiled from attendance at QSC meetings. These methods were used throughout the evaluation process designed to engage participants in negotiating and gathering data to ensure that the evaluation was responsive. In summary, a naturalistic and participant-oriented approach, based on the 4GE paradigm (Guba and Lincoln, 1989), was used in implementing the data collection procedures in order to provide a responsive approach to the concerns of the individuals for whom the evaluation was being conducted. The evaluation represented a serious attempt to meet the challenge posed by Fishman in his critique of 4GE that Guba and Lincoln could not provide "even one sample study...in enough detail to demonstrate in actuality the practical value of their model" (Fishman, 1992, p.268). Fishman argued that, while he remained open to the possibility that 4GE could be successful, "the model must be demonstrated with detailed case examples" (Fishman,
The choice of the 4GE paradigm was also made partly on pragmatic grounds in that many of the key stakeholders had expressed the wish to be involved in the evaluation, and partly on philosophical grounds of the perceived lack of relevance by them of more positivist approaches with which the group was familiar (Finger and Russell, 1994, p. 44). The process adopted required key participants to formulate the evaluation questions which ultimately shaped the evaluation study.

4.4 Steps Outlining the Program Evaluation Process.

The steps used in the evaluation process, displayed in Figure 4.2, are presented in a form similar to Stake's (1975) 'clock' (Figure 3.4) and take into account the steps outlining the 4GE process adapted by McEvoy and Rissel (1992) from Guba and Lincoln (1989) and Rissel (1991) (see Figure 3.6).

Figure 4.2: Steps outlining the Program Evaluation Process
Choice of Data Collection Methods and the Instruments

Due to being awarded a research scholarship from May until December in 1992, the opportunity to visit both school sites and employ a variety of data collection methods was available as that scholarship provided the researcher in his role as evaluator with five months within which he was released from his normal duties as Deputy Principal. Of particular importance, the research scholarship contract placed a time constraint on the conduct of the evaluation in that an evaluation report required by the Department of Education had to be completed by 4 December 1992. The steps employed in undertaking the evaluation and in meeting that report deadline are shown in Figure 4.2 (p. 122). A brief description of the data collection procedures chosen and developed is provided in the following discussion.

4.5.1 Situational Analysis

Situational analyses, as outlined by Marsh and Stafford (1992), were considered to be important for assisting in the process of describing the contextual setting within which the QSC operated by obtaining fundamental information about the two school sites. Also, this was seen to be an essential early step in identifying the participants (i.e. the QSC teachers). Consequently, situational analyses of both schools were undertaken to gather information related to the school community, the school, the teachers, the students, the classrooms, the technological resources, and the support staff. A checklist of information headings was devised by the evaluator to facilitate obtaining the information (see Appendix D).

4.5.2 Using Both Questionnaires and Interviews

Questionnaires limit the information to a written response of respondents to prearranged questions. Worthington (1982, p. 6) indicates that a questionnaire is:

"a list of questions or statements printed on a form to be filled out by respondents, usually in the absence of the evaluator".

The most common form of interview is the person-to-person interview in which an
Interviewer seeks information from a single respondent. However, groups of people or panels can also be used in interview situations. A major difference between using questionnaires and interviews "is that interviews allow clarification and probing" (Worthen and Sanders, 1988, p. 308). That is, because the interviewer and respondent are both present as the interview is conducted, questions can be communicated and answers elicited with potentially greater opportunity for exploring issues that were not predetermined by the evaluator. As Lancy (1993, p. 17) indicates, "Often one is rewarded by the interviewee presenting a view...which is completely unexpected".

According to Kidder (1981, pp. 148-153), in comparing interviews and questionnaires, advantages and disadvantages of both procedures can be identified. For example, questionnaires are usually less expensive to administer, avoid potential interviewer bias, respondents have greater anonymity, and they can place less pressure on the respondent for an immediate response. However, there are disadvantages in that the response rate of questionnaires is often not as high as the response rate of interviews, and some respondents might experience difficulty and/or are unable to fill out even simple questionnaires. Kidder (1981, p. 153) also suggests that interviews are more appropriate than questionnaires for obtaining information that is both complex and emotionally laden. Thorne (1990, p. 109) indicates that as both interviews and questionnaires have strengths and weaknesses, it is worthwhile attempting to complement the weaknesses of one with the strengths of the other. For example,

"...a questionnaire in having closed questions and therefore restricting answers is matched by an interview in which a wide range of response is possible".

For the reasons outlined above, both questionnaires and interviews were used in this study.

4.5.3 Questionnaires

Students were involved in two questionnaires - Initial Computer Questionnaire for Students May, 1992 (see Appendix E) and the Follow-up Computer Questionnaire for Students September, 1992 (see Appendix F). A questionnaire called Questionnaire for Teachers and School-level
Administrators May, 1992 was administered to teachers and school-level administrators (i.e. Principals, Deputy Principals, Registrars, Heads of Department) (see Appendix G). A questionnaire was also administered to the parents of the students involved in the project *Questionnaire for Parents of Sunrise Students* (see Appendix H).

Those questionnaires were designed to seek information from the key stakeholders in the project: i.e. the teachers, the students and their parents. Furthermore, they sought information related to the evaluation headings and the evaluation questions which had been formulated through a series of negotiations with key stakeholders. Following the determination of the objectives of the questionnaire, a series of steps were followed similar to that suggested by Brady (1992, p. 245). The steps followed in developing each of the questionnaires are shown in Figure 4.3.

1. **Determine** the information to be sought. Consider this in relation to the evaluation questions.
2. **Prepare** several drafts and refine the format to ensure that the questionnaire is clearly and attractively presented.
3. **Consult** with several of the stakeholders for whom the questionnaire is intended to check the validity of the items.
4. **Pilot** the questionnaire using a small but representative sample.
5. **Refine** the items further according to feedback from the pilot.
6. **Administer** the final questionnaire to the whole sample.
7. **Maximise** the response rate by personally delivering and retrieving the questionnaires to the students, the teachers, and the school-level administrators. Personally thank them for their efforts and indicate that their responses remain confidential and are valued.

Parent questionnaires were distributed to the students who then took them home and, subsequently, were required to bring them back to school for collection by the evaluator.

**Figure 4.3. Steps for Developing and Administering the Questionnaires**

The student questionnaires, following their refinement, were administered by the evaluator with the students in their class groups. The evaluator remained present throughout the process to assist in clarifying student concerns about confidentiality and indicating the
importance of gaining their opinions, perspectives, attitudes, and information. Parents were given the telephone number of the evaluator if they wished to make any enquiries needed to complete the parent questionnaire.

4.5.4 Questionnaire Distribution and Retrieval

The process of questionnaire distribution and retrieval generally reflected a very cooperative spirit between the evaluator, school-level administrators, teachers, students, and parents as suggested by Guba and Lincoln (1989) as part of the 4GE approach. No antagonism was expressed by any of the respondents. Indeed, most respondents displayed a willingness to assist the evaluation. That positive response could be attributed to several factors. Respondents were aware that the evaluation had the support of the Director-General of Education in Queensland, the support of Senior Officers from both Central Office and the South Coast Regional Office of the Department of Education in Queensland. There was also good support from the administration of both Coombabah State School and Coombabah State High School. The teachers, students and parents conveyed the general feeling that they realised that they were actively involved in a major technology initiative and were keen to provide assistance in enabling the research to learn as much as possible before the project ended. Table 4.3, on the following page displays the names and abbreviations of the questionnaires, the respondents, the number of questionnaires distributed, the number of questionnaires retrieved, and the response rate.

4.5.5 Interviews

As indicated earlier, interviews enable the researcher to be more responsive to the subject than questionnaires allow (Lancy, 1993). Moreover, the use of interviews as well as questionnaires enhances the validation of the evaluation. Semi-structured interviews were held with the QSC teachers. A semi-structured interview approach was chosen to take advantage of both structure and the opportunity for interviewees to elaborate, clarify, and illuminate issues which they perceived to be important. The structure of the interview, like
### Table 4.3. Distribution and Retrieval of Questionnaires

<table>
<thead>
<tr>
<th>Name of Questionnaire*</th>
<th>Respondents</th>
<th>No. Distributed</th>
<th>No. Retrieved</th>
<th>Response Rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ICQS</td>
<td>Year 7 Students CSS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Boys</td>
<td>28</td>
<td>28</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>Girls</td>
<td>28</td>
<td>28</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>56</td>
<td>56</td>
<td>100</td>
</tr>
<tr>
<td>ICQS</td>
<td>Year 8 Students CSHS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Boys</td>
<td>26</td>
<td>26</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>Girls</td>
<td>24</td>
<td>24</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>50</td>
<td>50</td>
<td>100</td>
</tr>
<tr>
<td>QTSLA</td>
<td>Teachers and School-level Administrators</td>
<td>15</td>
<td>14</td>
<td>93</td>
</tr>
<tr>
<td>QPSS</td>
<td>Parents of QSC Students</td>
<td>106</td>
<td>73</td>
<td>69</td>
</tr>
<tr>
<td>FCQS</td>
<td>Year 7 Students CSS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Boys</td>
<td>29</td>
<td>29</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>Girls</td>
<td>26</td>
<td>26</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>55</td>
<td>55</td>
<td>100</td>
</tr>
<tr>
<td>FCQS</td>
<td>Year 8 Students CSHS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Boys</td>
<td>26</td>
<td>26</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>Girls</td>
<td>22</td>
<td>22</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>48</td>
<td>48</td>
<td>100</td>
</tr>
</tbody>
</table>

*ICQS = Initial Computer Questionnaire for Students  FCQS = Follow-up Computer Questionnaire for Students QTSLA = Questionnaire for Teachers and School-level  QPSS = Questionnaire for Parents of Sunrise Students

The format and objectives of the questionnaires, was derived from the evaluation questions. The semi-structured interview schedule (Appendix I) was administered as a face-to-face interview with all of the six teachers involved directly with the QSC Project during 1992. A face-to-face interview is referred to in this study as:

"...a situation where one interviewer administers a relatively structured questionnaire to a single respondent within a limited time period and in the physical presence of the respondent." (Katos, 1992, p. 60.1)

Appointments were made with each of the teachers. Again, due to the research scholarship having been awarded to the evaluator, potential time and cost problems were minimal. A relaxed setting was established prior to the conduct of the interviews and interviewees were assured that their responses would be extremely important in investigating the evaluation questions. Moreover, responses were tape recorded following the gaining of each teacher's approval. Tape recording the responses was considered to be more suitable
than written notes for two reasons. Firstly, the interviews became more conversational and fluent than they would have been if interviewees had to stop while notes were recorded. Secondly, the recorded responses enabled more effective analysis of the responses after the interviews had been completed. For example, they allowed for replay to facilitate the careful transfer of full responses to providing a printed copy for subsequent analysis and reflection.

4.5.6 Classroom Observations

Unstructured classroom observations were undertaken through regular site visits over four months (June-September) in 1992. Each Thursday during those four months, the researcher visited the Year 7 QSC classroom at Coombabah State School and the Year 8 QSC classes at Coombabah State High School during the afternoon. An observation schedule was not used. Notes were taken of special tasks students were doing, summaries from conversations with students and teachers, and general classroom management and organisation observations were made.

During those visits, the students continued working unimpeded to ensure that a naturalistic setting was retained. Teachers were approached professionally to assure them that in no way should they feel either threatened or that the researcher would get in their way. The informal discussions held with students and teachers were always interesting and enlightening to the researcher and they assisted in helping to obtain a holistic portrayal of the complexities of the classroom situations.

4.5.7 Samples of Students' Work

Samples of students' work were examined to provide useful information about the processes and the products of the teaching and learning experiences. Some of the work was examined through viewing work displayed in the classrooms, teachers and students sharing and discussing samples of work with the evaluator, and representative samples of
16.8 Document Perusal and Analysis

SC documents were located and obtained from Central Office, South Coast Regional Office, and school sources. Many of these were provided by Coombabah State School as documentation had been shared with the school administration and teachers at the school by various departmental officers (e.g. Project Leader and Project Officer) and personnel from ACER. These provided essential information for reporting and analysing aspects related to the philosophy and rationale for the project, project description, and project management. In addition, the two research reports of the QSC Project (Ryan, 1991; Howe, 1992) were obtained and examined to identify the nature, purpose, findings, and the implications of the previous research undertaken.

16.9 Attendance at Sunrise Meetings

The researcher made himself available to attend meetings held by QSC staff at both schools. These meetings sometimes involved South Coast Regional Officers, school administration, as well as the teachers. Important issues were dealt with at those meetings. On some occasions, minutes of the meetings were recorded in a field diary and these provided a source of information. On other occasions, either tape recordings or notes were taken.

16.10 Post-Evaluation Check

A post-evaluation check strategy was employed. It was established in describing the significance of this thesis, and following a fruitless search for a model derived from the evaluation literature to guide this evaluation, that evaluation models appropriate for evaluating learning technology initiatives in schools is not well developed. Consequently, this study aimed to provide a significant theoretical contribution by developing an evaluation model which might be used as a basis for the evaluation of further learning technology initiatives.
as outlined in the following section, the model developed involved key participants in the project in the evaluation process. An evaluation of the evaluation itself, or what Worthen and Sanders (1988, pp. 370-371) refer to as a meta-evaluation, was seen as an important stage in the overall evaluation. To facilitate that meta-evaluation, each of the key participants was presented with a set of questions (Appendix J) to accompany the draft report. The draft report was given to each of the teachers, and copies presented to the Deputy Executive Director and the Assistant Executive Director (Studies) in South Coast Region, the school administrations of both schools, and the former Project Officer. Three general questions were addressed, viz.

Was the model used suitable for evaluation of the Queensland Sunrise Project?
How effective was the model for identifying the key components of the Queensland Sunrise Project?
What contribution does the program evaluation make for program improvement?

In addition, questions were derived from the guiding principles provided by the *Standards for Evaluations of Educational Programs, Projects, and Materials* (Joint Committee on Standards for Educational Evaluation, 1981) which presented standards related to four aspects of evaluation; i.e. utility, feasibility, propriety, and accuracy. That meta-evaluation provided an expression of valuing stakeholders' values, assisting with redeveloping group constructions and planning for future directions of the project (refer to Figure 4.2, p.122). McEvoy and Rissel (1992, p. 30) argue that the principles of 4GE in this way address the limitations of previous models as it

"...presents methods and strategies that accommodate and value stakeholder values; and it challenges traditional, empirical and quantitative techniques by espousing continual negotiation with stakeholders regarding all aspects of evaluation design, procedure and action on outcome. Such principles facilitate an evaluation process and consequent outcome that is purposive and meaningful and an experience that is empowering for participants."

4.5.11 Involvement of Key Participants

The research design emphasised the need to involve the participants in the evaluation process. Kemmis and Stake (1988, p. 11) argue that "All educators evaluate" and they suggest that:
"Proposals for action derived from evaluation are most practicable and appropriate when they draw directly upon the experience, understandings and critically examined interpretations of those responsible for the work of realising a curriculum in their own teaching and learning". (Kemmis and Stake, 1988, p. 11)

To ensure that critical and self-reflection is not sacrificed due to their involvement in the evaluation, Kemmis and Stake indicate special conditions for the evaluation to give those involved special freedoms; viz.

"the freedom to consider, reflect on and express their understandings and values
the freedom to articulate, share and collaboratively scrutinise their interpretations and judgments
the freedom to make and implement decisions in the light of their collective judgment, and to monitor and review the consequences of their decisions in action." (Kemmis and Stake, 1988, p. 12)

Participants were invited to contribute throughout the evaluation through negotiations and discussions with the evaluator to further illuminate the impact, issues, and implications of the project being studied using the 4GE philosophy (Guba and Lincoln, 1990). Under the overall guidance of the evaluator, each step in the evaluation process was discussed, shared and negotiated with the teachers and with senior Education Department personnel.

4.6 The Evaluation Questions, Program Evaluation Data Collection and Validation

A variety of data collection procedures were employed to gain quantitative and qualitative data. The multiple methods of data collection were chosen to address and investigate the evaluation questions guiding the study. Triangulation was used in this study through obtaining multiple sources of data and employing multiple methods. As suggested by Fetterman (1988, p. 54), "Qualitative data can validate or be validated by qualitative observations". Similarly, Lancy (1993, p. 20) argues that triangulation provides the qualitative researcher's "most effective defence against the charge of being subjective". This approach assisted in ensuring validity. Table 4.4, on the following page, illustrates the evaluation questions addressed and the data collection methods agreed to by the stakeholders. Table 4.5 displays the program evaluation timeline which was formulated
### Table 4.4: Evaluation Questions and the Program Evaluation Data Collection and Validation

<table>
<thead>
<tr>
<th>Evaluation Headings / Evaluation Questions</th>
<th>Issues</th>
<th>Data Collection and Validation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Institutional Analysis</strong></td>
<td>Innovative Investigation</td>
<td>Document Analysis QTSLA</td>
</tr>
<tr>
<td>Why was it initiated?</td>
<td>Rationale</td>
<td>SD: CSS</td>
</tr>
<tr>
<td>What is its setting and context?</td>
<td>Context</td>
<td>SD: CSBS</td>
</tr>
<tr>
<td>Who participates in the program?</td>
<td>Participants</td>
<td>Document Analysis QTSLA</td>
</tr>
<tr>
<td>What is the program’s history? How long is it supposed to continue?</td>
<td>Planning</td>
<td>Document Analysis QTSLA</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Project Management</strong></th>
<th>Implementation and Implications</th>
<th>Document Analysis QTSLA ITIS</th>
</tr>
</thead>
<tbody>
<tr>
<td>That was intended and what happened in terms of program management?</td>
<td>Intentionality/Reality Management</td>
<td>QTSLA ITIS</td>
</tr>
<tr>
<td>What are the implications for the management of further initiatives to integrate learning technology in schools in terms of personnel, resources, budgets, and training and professional development?</td>
<td>Information Needs</td>
<td>Document Analysis QTSLA ITIS</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Impact of the Project</strong></th>
<th>Impact and Implications</th>
<th>Classroom Observations QTSLA</th>
</tr>
</thead>
<tbody>
<tr>
<td>What impact did the Queensland Sunrise Centre Project have on the teaching and learning context in terms of classroom organisation and management?</td>
<td>Classroom Organisation and Management</td>
<td>SD: CSS SD: CSBS ITIS ICQ5 FCQ5 Written Contributions</td>
</tr>
<tr>
<td>What are the implications of the new and emerging technologies in curriculum design?</td>
<td>Curriculum</td>
<td>ITIS</td>
</tr>
<tr>
<td>Have there been changes in student learning through the use of laptop computers and immersion in a technology-rich environment?</td>
<td>Student Learning</td>
<td>Classroom Observations QTSLA</td>
</tr>
<tr>
<td>In what ways have the students been advantaged and/or disadvantaged by being involved in the program?</td>
<td>Gender Differences</td>
<td>ICQ5 FCQ5</td>
</tr>
<tr>
<td>Are there any gender differences; e.g. do girls react differently to new technology compared with boys?</td>
<td>Technical and Professional Support for Teachers</td>
<td>ITIS QPSS Students' Perspectives</td>
</tr>
<tr>
<td>How did teachers come to grips with the new technologies?</td>
<td>Stakeholders</td>
<td>QPSS</td>
</tr>
<tr>
<td>What are the implications for the training and professional development of teachers?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>What were the concerns and perceptions of parents?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Appraisal of the Model for Program Evaluation

- Was the model used suitable for evaluation of the Queensland Sunrise Project? PEC
- How effective was the model for identifying the key components of the Queensland Sunrise Project? PEC
- What contribution does the program evaluation make for program improvement? PEC

**Legend**
- NGT = Nominal Group Technique
- SD: CSS = Site Description: Coombabah State School
- ICQ5 = Initial Computer Questionnaire for Students
- QTSLA = Questionnaire for Teachers and School-level Administrators
- PEC = Post Evaluation Check
- SD: CSBS = Site Description: Coombabah State High School
- FCQ5 = Follow-up Computer Questionnaire for Students
- QPSS = Questionnaire for Parents of Sunrise Students
- ITIS = Individual Teacher Interview Schedule
<table>
<thead>
<tr>
<th>Identify key participants and outline the research task:</th>
<th>Meet with and notify regional officers, school admin., teachers, students.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identify research questions:</td>
<td>NGT Workshop</td>
</tr>
<tr>
<td>Site Descriptions:</td>
<td>SD: CSS / SD: CSHS</td>
</tr>
<tr>
<td>Questionnaires: Students</td>
<td>ICQS</td>
</tr>
<tr>
<td>Teachers</td>
<td>QTSLA</td>
</tr>
<tr>
<td>School-level Admin. Parents</td>
<td>QBSS</td>
</tr>
<tr>
<td>Interviews: Teachers</td>
<td>ITIS</td>
</tr>
<tr>
<td>Written Contributions: Teachers Students</td>
<td>Teacher reflections, classroom action research projects ...</td>
</tr>
<tr>
<td>Former Project Officer/Research Officer</td>
<td>Student perspectives</td>
</tr>
<tr>
<td>Additional Sources:</td>
<td>Implications for program management</td>
</tr>
<tr>
<td>Attendance at QSC Meetings</td>
<td>Various dates</td>
</tr>
<tr>
<td>Classroom Observations</td>
<td></td>
</tr>
<tr>
<td>Samples of Students Work</td>
<td></td>
</tr>
<tr>
<td>Document Perusal and Analysis</td>
<td></td>
</tr>
<tr>
<td>Report Preparation:</td>
<td>Supervision and guidance by Assoc. Professor Neil Russell (GUGC)</td>
</tr>
<tr>
<td>Report Presentation:</td>
<td>Progress reports at various meeting dates</td>
</tr>
<tr>
<td>Post Evaluation Check:</td>
<td></td>
</tr>
<tr>
<td>Final Report Publication:</td>
<td></td>
</tr>
</tbody>
</table>

**Key:**
- NGT = Nominal Group Technique
- SD: CSS = Site Description: Coombabah State School
- SD: CSHS = Site Description: Coombabah State High School
- ICQS = Initial Computer Questionnaire for Students
- QTSLA = Questionnaire for Teachers and School-level Administrators
- QBSS = Questionnaire for Parents of Sunrise Students
- ITIS = Individual Teacher Interview Schedule
- PEC = Post Evaluation Check
to provide direction to the evaluation process. As indicated earlier in this Chapter, the research scholarship contract placed a time constraint on the conduct of the evaluation (refer to Figure 4.2, p. 122) as an evaluation report for the Department of Education in Queensland had to be completed by 4 December 1992.

4.6.1 Validity and Reliability

As Merriam (1988, p. 163) indicates, all research "is concerned with producing valid and reliable knowledge in an ethical manner". Merriam suggests that validity and reliability are concerns that need to be addressed according to appropriate standards formulated through "careful attention to a study's conceptualization and the way in which the data were collected, analyzed, and interpreted" (Merriam, 1988, p. 165). This study of the QSC as the focus for an evaluative case study, requires a different set of criteria for 'trusting the study' than if the rationale of the study was to test a set of hypotheses. However, the basic question remains - to what extent can the evaluator 'trust' the findings of the study? The following discussion describes the strategies employed to address the issues of internal validity, reliability, and external validity. In addition, the issue of ethics is examined.

4.6.1a Internal Validity

One of the assumptions underlying this study is that reality is holistic and dynamic. For example, the learning experiences of the students are not seen as fixed, objective events able to be observed and measured. Reality, according to Lincoln and Guba (1985, p. 295) is:

"a multiple set of mental constructions... made by humans; their constructions are on their minds, and they are, in the main, accessible to the humans who make them".

Therefore, according to Lincoln and Guba (1985, p. 296) judging the truth or validity of a study relies upon the evaluator establishing that:

"... he or she has represented those multiple constructions adequately, that is, that the reconstructions (for the findings and interpretations are also constructions, it should never be forgotten) that have been arrived at via the inquiry are credible to the constructors of the original multiple realities".

Thus, the evaluator is concerned with investigating perspectives of the participants.
Several strategies were employed in this study to address the issue of internal validity. Triangulation, participant checks, site observations, participants’ examination of findings, and participation by the participants in the evaluation process were important features of the study’s research design. Triangulation is referred to by various writers (Merriam, 1988; Fetterman, 1998; Lancy, 1993) as a strategy involving the use of more than one method of data collection used to study an issue, problem, or question. The use of multiple methods for data collection and validation in this study is shown in Table 4.4 (p.132). For example, in examining the evaluation question - In what ways have the students been advantaged and/or disadvantaged by being involved in the program?, multiple methods and multiple sources of data were used. Items on both of the two student questionnaires addressed these questions. Furthermore, these were questions asked of the teachers during the semi-structured individual teacher interviews. Parents were also asked those questions on the parent questionnaire.

Participant checks were regularly undertaken throughout the study. That is, information, progress reports and findings were shared with the teachers and teachers were asked if the writing progress and data collection and analyses was credible. Progress reports were also presented at the regional level through the evaluator tabling reports for discussion at the South Coast Technology Education Reference Group meetings.

Site observations at both of the schools undertaken regularly to enable the collection of data over a sustained period of time increased the validity of the data collection. Fieldwork or field observations involved visiting the QSC sites at both Coombabah State School and Coombabah State High School to observe the teachers and the students in action. Permission to visit both sites was obtained as an essential part of the approval to undertake the study. Guba and Lincoln (1981, p. 213) point to the importance of observing the phenomenon being evaluated.

"In situations where motives, attitudes, beliefs, and values direct much, if not most human activity, the most sophisticated instrumentation we possess is still the careful observer - the human being who can watch, see, listen... question, probe, and finally analyze and organize his direct experience."
Participants' examination of the findings were undertaken to allow the participants opportunities to comment on the findings as they emerged. Through the use of the data collection procedures employed, a great deal of data was collected. This information was shared with the participants and they were invited to comment. This included the information gained from students and parents as well as from the teachers and school-level administrators. In particular, drafts of the chapters reporting the findings were made available for their perusal.

Central to the research design was the participation by the QSC participants in the evaluation process. This involvement was encouraged from the early stages of the evaluation when participants were identified and the evaluation questions were formulated. That encouragement and involvement continued throughout the evaluation. Through the facilitation of a participatory mode of research, the internal validity of the evaluation was enhanced. Russell and Willinsky (1995, p. 18) suggest that, as teachers can expect to interact with other stakeholders in improving learning and teaching in their classrooms, it requires teachers "to acknowledge both their unique political context and also the range of value positions operating with different stakeholders". Consequently, they argue that stakeholders should be involved, as occurred in this study, from the beginning of the process.

4.6.1b Reliability

The purpose of the evaluation in this thesis was to describe and make judgments about the QSC Project as those involved in the project interpret it. As the project was a dynamic, innovative, 'lighthouse' investigation into students and teachers working in technology-rich classroom environments, there were no standards or benchmarks by which this study could establish reliability in terms of the traditional concept. That is, reliability could not be determined through examining the extent to which the findings of this study can be replicated. It is argued that because what is being studied is assumed to be:

"...in flux, multifaceted, and highly contextual, because information gathered is a function of who gives it and how skilled the researcher is at getting it, and because the emergent design of
a qualitative case study precludes a priori controls, achieving reliability in the traditional sense is not only fanciful but impossible." (Merriam, 1988, p. 171)

Therefore, as the notion of reliability in the traditional sense is deficient for case study, Lincoln and Guba (1985, p. 288) suggest that rather than demanding that outsiders get the same results, the aim is for outsiders to concur that, given the data collected, the results make sense, are consistent, and are dependable. Thus, reliability in this approach is obtained through an understanding that reliability and validity are inextricably linked. As Guba and Lincoln (1981, p. 120) argue, "Since it is impossible to have internal validity without reliability, a demonstration of internal validity amounts to a simultaneous demonstration of reliability". The strategies employed to ensure internal validity (e.g. triangulation) also ensure that the findings of this study are reliable.

### 4.1c External Validity

External validity, according to Merriam (1988, p. 1173), is concerned with the extent to which the study findings can be applied to other situations. Again, Guba and Lincoln (1981, p. 115) indicate that to discuss this issue, internal validity is important as "there is no point in asking whether meaningless information has any general applicability". The purpose of this evaluation study is to investigate the QSC Project in depth and not to find out about what might be 'true' of many other situations. However, it is argued that we can learn from case study in terms of external validity through thinking in terms of the audiences of the study. As Walker (1980, p.34) indicates, it "is up to the reader who has to ask, what is there in this study that I can apply to my own situation, and what clearly does not apply?". More recently, Groundwater-Smith and White (1995), in arguing for project evaluation to be treated as a case study suggest that:

"This enables us to recognise the particularities and idiosyncrasies present in a specific school, and also allows us to pool cases together in order to understand larger phenomena or general principles. This has long been the situation in professional practices such as law and medicine, where case studies have acted both to enable theory building, and as valuable resources for professional education". (Groundwater-Smith and White, 1995, p.166)

For the generalizability of the case study's results to be enhanced, the evaluation must provide a detailed description of the context of the study so that the description specifies
thing that a reader may need to know in order to understand the findings" (Lincoln and Guba, 1985, p.125). To ensure that the external validity of this study was enhanced this report provides description and evaluation information "so that anyone else interested in transferability has a base of information appropriate to the judgment" (Lincoln and Guba, 1985, pp. 124-125).

17 Ethics

The issues related to the ethics of carrying out an evaluation needed to be addressed and considered throughout the entire evaluation process. Indeed, Hill (1992) in outlining ethical considerations in evaluation warned that "Many people become involved in evaluation exercises without necessarily realising they have entered a moral minefield" (Hill, 1992, p.3). He drew attention to the trend for evaluation to involve the participants in the evaluation and this unaviodably introduces a moral dimension to the evaluator's role. Thus, Hill argues that evaluation studies need to be concerned with the ethical dimension as well as the analysis and measurement undertaken.

In addition, Hill (1992, p.15) notes that, while the development of a more professional approach to evaluation resulted initially in a strong emphasis on the evaluator being a trained external arbitrator, it was soon realised that this approach was still as much a top-down model as the traditional model in which management undertook internal top-down audits whenever it chose to. Moreover, Hill suggests that this approach did not necessarily safeguard "the rights of those being appraised or capitalise on their inside views of the situation" (Hill, 1992, p. 15). He argues that both the ethical and empirical considerations have been influential in determining the current view that evaluation should be a process in which all the stakeholders participate. Through the participation of stakeholders, this approach has the potential for all participants to protect their own moral interests.

The researcher undertaking the evaluation was the Deputy Principal at Coombabah State School, one of the school sites at which the QSC is located. The selection of the evaluator resulted mainly from that person's interest in, commitment to, and ownership of the project.
Since its inception at Coombabah State School. Access to both of the school sites was negotiated. The participants at both school sites were very cooperative and contact with all of the teachers involved in the project was established. The nature of the planned data collection was discussed with and determined by the respective personnel involved and they displayed a willingness to negotiate times, places, and cooperative approaches with the researcher in his role as evaluator undertaking the various data collection procedures. This study was conducted by the evaluator along consensual lines using all of the attributes of 4CE (Guba and Lincoln, 1990). For example, the key participants were involved in establishing the evaluation questions, and the data collection procedures were developed and implemented through a series of negotiations with participants.

A draft report was presented to each of the key participants as they were perceived as owners of the evaluation report. They were provided with the opportunity to ensure that their rights had been protected. In particular, they were urged to ensure that the report did not enable them to be incriminated against in any way and/or that their confidentiality had been threatened. Furthermore, participants were asked to comment about changes that might need to be made before final publication and to reach consensus about the distribution and dissemination of the report. The decision about dissemination had to be made within the context that the Department of Education, Queensland which had been the sponsoring body of the evaluation required a copy of the report as a requirement of the scholarship contract. They were also asked to ensure that ethical concerns had been considered. That is, had the evaluator collected, used and reported data from the human subjects in a manner which did not infringe upon the basic rights of any of the participants?

In summary, the evaluation was conducted against a background of ethical considerations. These related to ethical concerns about gaining access to the sites, the way in which the evaluation was conducted, the moral rights of the participants being respected, and the ownership and decisions about the dissemination of the published report.
Treatment of the Data

The Model for Guiding the Program Evaluation of the Queensland Sunrise Centre Project (Figure 3.11, p.110) provided the framework for the data collection and the treatment of data. In particular, the evaluation Forms presented by Owen (1992) assisted in clarifying the choice of an appropriate approach best suited to this particular study. It was determined that two evaluation Forms would be employed - process evaluation and impact evaluation. Within the model which was subsequently developed, three major headings were used - Situational Analysis, Project Management, and Impact of the Project. Within each of those three areas, the various evaluation questions are addressed through findings gained by the data collection procedures employed. Information relating to the evaluation questions which sought to appraise the model for the program evaluation was gained through a post-evaluation check strategy. That information is presented in the final chapter of this thesis (see Chapter Seven, pp. 264 - 274).

This thesis is characterised by methods designed to explore, find patterns, learn from a site or a series of group discussions or an event (Daly and Richards, 1990). Richards and Richards (1992, p. 83.1) indicate that in such research the goals are perceptions, insights, and coherence rather than testing hypotheses and theories (Richards, 1990). A great deal of data was collected which resulted from interviews, observations, meeting notes, and responses to open ended questions on the questionnaires administered which required analysis. Software programs have now achieved a "plateau of competence in their one way of handling text - coding it so that all material to which any particular code or codes can be retrieved" (Richards and Richards, 1992, p.p. 83.1-83.2). The NUDIST (Non-numerical Unstructured Data Indexing, Searching and Theory-building) was ordered from La Trobe University but did not arrive in time to allow for its use. However, other integrated software programs (i.e. Clarisworks) were used to assist in the process of managing the data through entering and storing the text on a Macintosh computer and then proceeding to create an index system, and implement searches for analysis of the data. This enabled responses to be "decontextualised" so that they could be "recontextualised" according to topics through coding and retrieval (Tesch, 1990).
Other data, which required more of a quantitative mode of collation and treatment were presented in a form which enhanced audience understanding and readability through the presentation of absolute frequency, relative frequency (%) and, where possible, graphical representation. Some of the participants in the project indicated that they were 'visual' learners and suggested that graphs could assist in their understanding of the findings and results. Several options were discussed with the teachers and they felt that the following presentation presented results effectively. For example, Figures 4.4 and 4.5 display the results obtained from the QSC students on two of the items on the Initial Computer Questionnaire for Students May, 1992.

**Figure 4.4: The Extent of Computer Use by Students at Home BEFORE Their Involvement in the Queensland Sunrise Centre**

**Figure 4.5: The Extent of Computer Use by Students at School BEFORE Their Involvement in the Queensland Sunrise Centre**
The Chi Square Test ($\chi^2$) was applied to some data as a test of independence; i.e. that one variable is not affected by, or related to, another variable. As Best (1981, p. 287) indicates:

"The $\chi^2$ is not a measure of the degree of relationship. It is merely used to estimate the likelihood that some factor other than chance (sampling error) accounts for the apparent relationship. Since the null hypothesis states that there is no relationship (the variables are independent), the test merely evaluates the probability that that the observed relationship results from chance."

Following the calculation of $\chi^2$ values, the $\chi^2$ value was checked to see if it equalled or exceeded the appropriate $\chi^2$ table critical values (see Best, 1981, Abridged Table of Critical Values for Chi Square, p. 413) to enable the justification of the null hypothesis or the assumption of independence at the .05 or .01 level of significance.

Thus, due to the collection of both quantitative and qualitative data, the treatment of the data required various approaches to enable effective, reliable reporting of findings. The findings are reported in a variety of formats in Chapters Five and Six - tables, graphs, extracts from documents, quotes from meeting notes, individual responses from interviews, and observations. Collectively, they portray and present the QSC Project evaluation findings in order to increase audience understandings about the project.

**4.9 Conclusion**

This chapter has outlined the research design for this study in which the QSC is the focus of a case study. The research design was described in terms of the study sample, the research methodology and the program evaluation data collection procedures employed. Case studies were defined and the summary of the data collection procedures chosen indicated that a range of procedures were employed; viz. site descriptions, questionnaires, interviews, classroom observations, samples of students' work, document perusal and analysis, and notes compiled from attendance at QSC meetings.

The data collection instruments used in the study were described. Furthermore, the steps employed in undertaking the program evaluation were outlined. The strategies for ensuring reliability and validity in undertaking case studies were examined in terms of
internal validity, reliability, and external validity. Ethical considerations were then discussed. Finally, the treatment of the range of quantitative and qualitative data obtained was outlined. The following chapters report the findings of this research.
CHAPTER FIVE

FINDINGS

(a) SITUATIONAL ANALYSIS AND PROJECT MANAGEMENT

This is the first of two chapters which present the findings of the program evaluation of the QSC Project. Through addressing the following questions, Chapter Five provides a situational analysis of the QSC Project and investigation of the QSC project management:

Situation Analysis of the QSC Project:

Why was it initiated?
What was its setting and context?
Who participated in the program?
What was the program's history? How long was it supposed to continue?

Project Management:

What was intended and what happened in terms of program management?
What are the implications for the management of further initiatives to integrate learning technology in schools across Queensland in terms of personnel, resources, budget, and training and professional development?

Examination and reporting findings derived from the situational analysis and related to program management, the following discussion and analysis is couched within the framework presented in Chapter Three using the model developed to guide the research (Figure 3.11, p.110). That model drew attention to examining what was intended and what happened in terms of program description and management. Resources were examined according to what was needed (i.e. people, equipment, money, and training and professional development) and what was available. Processes were investigated in terms of what we intended to do and what we did. Results referred to what the QSC Project Team intended to happen with program management and what actually happened. There was considerable overlap between the processes involved in examining resources, processes, and results. For example, while findings about resources were being examined, issues relating to processes...
and results also emerged. Official QSC (i.e. Department of Education, Queensland endorsed) planning documents provided an essential source of information relating to intentions of the project at the policy and planning level. Questionnaires and interviews with key participants, classroom observations and meeting notes provided critical insights into what happened at the school and implementation level. Subsequently, implications for the management of further technology initiatives in schools across Queensland were drawn from an identification of the perceived strengths and weaknesses of the QSC program management employed.

§ 1. Situational Analysis of the Project:

§ 1.1 Why Was It Initiated?

The QSC Project was initiated to enable the investigation of "the educational potential of computers through the establishment of a special classroom learning environment within an existing primary and secondary school" (Grimmett, 1991, p.2). Officially, it was established for two broad reasons; viz.

"* to investigate ways in which new information and communication technologies could be used to enhance and extend the learning of young Australians; and
* to enable active participation within an educational technology research community in Australia which is evaluating critically the practices developing around new technologies, investigating innovative learning environments and charting a path for future use." (Vogler, 1989, p. 2)

According to Grimmett (1991, pp. 3-5), the establishment of this project was derived largely from the notion that children using computer systems as personal intellectual tools needed to be explored. Grimmett (1991, p.3) suggested that it had been widely accepted that considerable experience and knowledge had been built within schools in which technology had been integrated into classrooms as "delivery systems for teaching and learning in various curriculum areas" which he referred to as using computers as amplifiers. Grimmett noted that it was considered important that a long-term research project should be established which could:

"inform a variety of Departmental agencies about the success of this approach in schooling;"
identify any implications for future information technology programs regarding the resourcing of schools, the professional development of teachers; and indicate the nature and extent of classroom support services.” (Grimmett, 1991, p. 4)

The following sections of this thesis report the official goals of the QSC Project and analyses the participants’ beliefs about why they believed it was established and why it was unique when compared with other computer initiatives in Queensland schools.

### 5.1.2 Goals of the Project - Official View

The goals of the project were:

- to develop a personal, comprehensive, integrated technology-based literacy as a partial substitute for the literacy based on the extensive use of paper, pencil and printed media to which students essentially have been confined in the past;
- to develop a technology-rich environment for students by providing them with a new computational environment and to evaluate this environment as a tool to foster an independent approach to learning;
- to investigate the implications for curriculum implementation, classroom organisation and management, and teaching and learning strategies of adopting the new environment in schools;
- to develop innovative learning activities, work units and assessment procedures which would otherwise not be available to students not using the QSC approach to learning, but which nevertheless fulfil the requirements of the existing Years 6-8 syllabuses in the areas addressed by the project;
- to examine and document the role of the teacher in classrooms where extensive use is made of self-directed, child-centred activities; and
- to investigate the transferability from upper primary to lower secondary of this approach to learning and curriculum implementation.” (Grimmett, 1991, pp. 4-5)

Essential principles therefore were inferred for the classroom culture of the QSC in that it was to be built upon the constructivist belief that knowledge is created by the learner (Grimmett, 1991, p.4). That is, students would become involved in processes which encouraged them to evaluate their own knowledge, reconstruct their knowledge, and extend their knowledge. In addition, the classroom culture was expected to value collaboration and cooperation, and knowledge would be seen to be a shared public utility in which its subsequent evaluation becomes dependent upon its utility according to a variety of contexts (Department of Education, 1990a). Logo was to be extensively used to ensure that students could share their developing skills and knowledge.
The school-level administrators (i.e. Principals, Deputy Principals, Registrars), the former Project Officer, and the teachers directly involved in the QSC at Coombabah State School and Coombabah State High School expressed views largely congruent with the ‘official’ view for the establishment of the QSC. The former QSC Project Officer, for example, indicated that the QSC was established;

"A - To explore the possibility of using computers as intellectual tools
B - To provide insights into professional development required by teachers if they are to use it in this way (see A)
C - To develop knowledge regarding curriculum and management required to facilitate A."

(Former Project Officer, May, 1992)

Other responses emphasised the importance of the QSC as a site for investigating students operating in technology-rich environments:

"I believe it was established as a "What if" situation that would attempt to see into the future of education investigating the changes that would take place to curriculum, children's learning, teachers' behaviour and role and the classroom if every child was given [Logo and technology] as a tool to learn with." (QSC Teacher, May, 1992)

"To research, investigate and develop ways of enhancing learning through the use of information technology (CD ROM, scanner, continuous access to printers, desktop monitors, laptop computers) in the classroom and at home (i.e. 24 hours a day, 7 days a week)." (QSC Teacher, May, 1992)

"To investigate ways in which technology can be used to enhance learning in classrooms." (Deputy Principal, May, 1992)

"To investigate the impact of information technology on the learning environment in relation to learning styles, classroom relationships, problem solving and building personal 'building blocks' using Logo." (QSC Teacher, May, 1992)

"As an experiment to ascertain:-
- what student learning was possible using current electronic technology (total immersion on an unlimited budget)
- how this learning differed from that gained in conventional classrooms
- to what degree students could/would become responsible for their own learning outcomes and to be able to make informed recommendations on future educational strategies and
- to develop ideas/programs that could be used by other students in more conventional classrooms to reinforce their learning experiences."

(Head of Department, May, 1992)
"As an experiment into total immersion of students in computer technology." (QSC Teacher, 1992)

The principal of the primary school involved highlighted the importance of the QSC for system information:

"Provide systemic information on teaching and learning implications provided there was a technology rich environment provided." (Principal, May, 1992)

However, a teacher in the project provided a rather cynical view which did not refer to the investigative nature of the project, but instead indicated that while it was a technology initiative there were perhaps other motives for the project's establishment:

"An initiative in technology. Good P.R. Possibly a 'passing shot' by a departing government aimed to cause an incoming government a little trouble." (QSC Teacher, May, 1992)

The primary school registrar suggested that as well as examining computer literacy, the focus of the project was to examine the financial implications of introducing technology in schools.

"Develop computer literacy in primary age students. To monitor feasibility of such a project and the costs and benefits of introducing such programmes into primary schools." (Registrar)

The project experienced significant laptop computer repairs which presented problems in terms of both developing efficient processes for expediting the repairs and funding the extensive repairs frequently needed. Often, those problems were dealt with by the Registrars in the schools in liaison with the teachers.

5.1.4 Was There Anything Unique About the QSC When Compared With Other Computer Initiatives in Schools? - Participants' Perceptions

All QSC teachers, school administration team members, Regional Officers, educational advisers and the Project Officer involved with the QSC Project indicated that they believed that there was something unique about the QSC Project. Participants' perceptions indicating why they believed that it was unique revealed considerable congruence with the official goals of the program. For example, the following comment reflected the high level of...
technological resources:

"a) the children have their own personal computer
b) the computer is taken home at night and over the weekend
c) the children are able to use CD ROM, scanner, monitor whenever necessary." (QSC Teacher, May, 1992)

That high level of resourcing also raised doubts in the minds of some that it was likely that the level of resourcing in the QSC Project could ever be extended system-wide:

"I don't believe the kind of financial assistance given to this project can possibly be justified in terms of education for all children at the systems level." (Deputy Principal, May, 1992)

Many of the comments suggested that the project was unique because it went beyond merely providing high levels of access to technological resources. Comments suggested that new approaches to learning were being explored, students were encouraged to be more responsible for their own learning, and there was an emphasis on programming and risk-taking.

"Sunrise is a dimension beyond what has been done in other primary schools where the focus is really interaction with established software. Through Logo especially an opportunity is given to students to make their computer a 'tool' for their own decision making in learning." (Principal, May, 1992)

"It is concerned more with "How children learn" than providing simulation games as motivational material. It looks at far more than hardware and software. The depth of commitment is enormous." (QSC Teacher, May, 1992)

"(1) Number of computers
(2) High degree of student involvement in content/approach - ownership, control, empowerment of students
(3) emphasis on programming at an early age
(4) open ended nature/risk taking
(5) lots more." (QSC Teacher, 1992)

"Extreme use of Logowriter.
Coupling technology with the self-motivation/investigative learning style. Desire to concentrate on the learning steps/mechanism." (QSC Teacher, May, 1992)

"The degree to which students are responsible for their own learning outcomes. Students encouraged to construct their own knowledge from raw data." (Head of Department, May, 1992)

The length of the project was cited as being an important feature. The project aimed to involve two groups of children throughout the planned four years to enable a longitudinal
The commitment to maintain the concept of a learning environment by the teachers - especially the long term ones is special (not unique)." (QSC Teacher, May, 1992)

"Structure of the program; i.e. length, grouping, staffing, availability of resources." (Deputy Principal, May, 1992)

A claim was made by the former Project Officer that the QSC Project was unique in that it was the "only longitudinal study... in Australia or the world at this time" (Grimmett, 1991) which was exploring the possibility of using computers as intellectual tools, providing insights into professional development requirements of teachers to use computers in that way, and developing knowledge regarding curriculum and management to facilitate the use of computers as intellectual tools.

1.5 What Was its Setting and Context?

The QSC was established at Coombabah State School and Coombabah State High School. Both schools are located in the South Coast Region of the Department of Education, Queensland. The selection of these schools was consistent with the program planning notion that the QSC would operate in two neighbouring schools - one of which was to be a primary school and the other school was to be a secondary school. Moreover, the schools were located close to Brisbane to enable contact between the coordinating and support groups from the principal project partners. At the conception of the project in 1989, project partners consisted of the Department of Education, Queensland, ACER, and the University of Queensland. The monitoring, evaluation and research activities were to be determined through consultation between the project partners (Vogler, 1989, p.2).

1.6 Who Participated in the Program?

The selection of the schools, teachers and students was planned to accommodate the criterion that most of the students (>80%) would move from Year 7 to Year 8 in the sec-
secondary school chosen to enable the group to remain together during their planned involvement in the project. Parents were informed of their children being selected to be participants in the program and their consent was sought. It was recognised that it would be necessary to "keep the confidence of students' parents that their children will not be disadvantaged through participating in the project" (Vogler, 1989, p.12). During the selection process, administrators and teachers were asked to indicate their commitment to remain involved throughout the life of the project. Furthermore, the teachers were to be selected according to their:

"...disposition, background, training, familiarity with the use of information technology, creativity, ability to cope with change, ability to implement innovative learning systems." (Vogler, 1989, p. 7)

Since the inception of the QSC Project in 1990, most of the students (> 80%) and most of the teachers have remained in the project. For example, all three of the primary school teachers initially selected remained with the project throughout 1990 and 1991. One of the teachers left the project in 1992 when the project no longer needed three primary school teachers to be involved. The two remaining teachers were still involved in the project in its third year of operation. The research expanded in 1991 to include almost one hundred and twenty Year 6 and Year 7 students, and five teachers. An overview of participants in the project is displayed below in Table 5.1.

<table>
<thead>
<tr>
<th>Table 5.1: Overview of the Participants in the QSC Project 1990 - 1992</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>First wave of students</td>
</tr>
<tr>
<td>Boys</td>
</tr>
<tr>
<td>Girls</td>
</tr>
<tr>
<td>Total</td>
</tr>
<tr>
<td>Second wave of students</td>
</tr>
<tr>
<td>Boys</td>
</tr>
<tr>
<td>Girls</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>
This data collection for this research, undertaken in 1992, was conducted with 56 Year 7 students (N(Boys) = 28, N(Girls) = 28) and 50 Year 8 students (N(Boys) = 26, N(Girls) = 24). Those enrolments differed only slightly from the numbers involved in the two earlier studies (Ryan, 1991; Rowe, 1992). Ryan's study involved 54 Year 6 students (N(Boys) = 26, N(Girls) = 28) and Rowe's study involved 56 Year 6 students and 59 Year 7 students. The number of students did not change to any great extent during the data collection phase conducted from April until December 1992 (see Chapter 4, Table 4.5, p. 133) for this thesis. The number of Year 7 students increased slightly to 60 students due to an administrative decision that new enrolments needed to be placed in the QSC classroom as the other Year 7 drafts at the primary school had also reached approximately 60 students.

The number of students in the Year 8 draft had decreased slightly due mainly to some parents electing to enrol their children in other secondary schools either through personal preference or through employment transfers. Table 5.2 further illustrates that most of the children had been involved in the QSC Project for a sustained period as planned.

**Table 5.2: Length of Student Involvement in QSC Project**

<table>
<thead>
<tr>
<th>Length of Involvement</th>
<th>Boys</th>
<th>Girls</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 years</td>
<td>26</td>
<td>24</td>
</tr>
<tr>
<td>2 - 5 months</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>1 month</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>less than 1 month</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>28</td>
<td>28</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Length of Involvement</th>
<th>Boys</th>
<th>Girls</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 years</td>
<td>22</td>
<td>22</td>
</tr>
<tr>
<td>2 years</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>26</td>
<td>24</td>
</tr>
</tbody>
</table>

Students had been selected to include similar numbers of boys and girls and to have classes which were composed of students of mixed abilities and behaviours. Rowe (1992) indicated that, in her total sample, the average IQ for girls was 107 (SD = 11) and for boys the average IQ was 102 (SD = 12). As displayed in Tables 5.1 and 5.2 above, the composition of the study sample remained very similar for this study. Information was also gained to examine the extents to which students perceived that they had an interest in computers, had access to computers at home, and that they had used computers at school and at home before their
Only 9 students (8%) indicated that they were interested in computers to a very great extent and a further 23 students (22%) of those studied indicated that they were interested in computers to a great extent \textit{before} their involvement in the QSC Project. Almost 50% of students expressed that they had very little or no interest at all. As shown below in Table 5.3, 54% of the students had access to computers at home, which was similar to that reported by Rowe (1992) that 54% of the students had access to family computers at home.

\begin{table}[h]
\centering
\caption{Does your family have a computer in your home?}
\begin{tabular}{|c|c|c|c|c|c|}
\hline
\textbf{Response} & \textbf{Boys} & \textbf{Relative Frequency (\%)} & \textbf{Girls} & \textbf{Relative Frequency (\%)} & \textbf{Total} & \textbf{Relative Frequency (\%)} \\
\hline
\textit{Yes} & 28 & 52 & 29 & 56 & 57 & 54 \\
\textit{No} & 26 & 48 & 23 & 44 & 49 & 46 \\
\hline
\textbf{Total} & 54 & 100 & 52 & 100 & 106 & 100 \\
\hline
\end{tabular}
\end{table}

Further investigation revealed that many of those computers had been purchased by students' families within the last three years. That is, although their children had been supplied with a laptop for their own use at school and at home, some parents had still purchased additional hardware for home use. Anecdotal evidence gained from some students suggested that some families had become more interested in computers through their laptop use at home. Several students, for example, stated that their parents had used their laptop computers for doing business letters and some of their older brothers and sisters had used their laptop computers for assignments.

Figures 5.1 and 5.2 respectively display the low extent to which students perceived that they had used computers at home and at school before their QSC involvement. There was little difference between Year 7 girls and boys with 60% of boys and 57% of girls indicating they had used computers at home before their QSC involvement to a very little extent or not at all. However, while 31% of Year 8 boys had used computers at home to a great or very great extent, only 4% of Year 7 girls had used computers at home to that extent. Moreover, none of the Year 8 girls stated that they had used computers at school to a great
or a very great extent before their QSC involvement, while 15% of the Year 8 boys indicated that they had used computers to a great or very great extent. In addition to that information about the low extent of use of computers at school and at home by students before their QSC involvement, students also perceived that their understanding of computers was also low (Figure 5.3). Only 8% of students indicated they had gained an understanding and skill in using computers to a great or very great extent.

Figure 5.1: The Extent of Computer Use by Students at Home BEFORE Their Involvement in the Queensland Sunrise Centre

Figure 5.2: The Extent of Computer Use by Students at School BEFORE Their Involvement in the Queensland Sunrise Centre
Therefore, before their involvement in the QSC Project, most students generally perceived that they had used computers at home and at school to a little or no extent. While slightly more than half of the students had access to a family computer at home, only a very small proportion of students believed that they had a great or very great understanding and skill in using computers before their QSC involvement. Findings were similar for boys and girls, although Year 8 girls were found to have used computers at school and at home to a lesser extent than Year 8 boys.

From the survey administered in 1992 (Appendix G), it was also found that the QSC teachers had little or no skill and understanding in using computers before their involvement in the QSC Project. Several teachers had shown personal interest in using computers in their classrooms and one teacher, in particular, had been considered to be a key computer resource person within her school. Much of the teachers' previous experiences, however, had been with Apple computers. Thus, working with laptops and Logowriter had been totally new to all of the primary school teachers. The secondary teachers, in a similar spirit to the primary teachers, indicated a willingness to learn about using computers with students. There was also a general indication from them that they felt they should have had more extensive inservice in using laptop computers and preparation for using Logowriter.
The planned life of the QSC Project was four years; viz. 1990 - 93. Official planning implementation (Vogler, 1989, p. 6) indicated that this would be the minimum time required for the project to "properly explore the proposed computer environment and classroom methodologies". As outlined earlier, two groups of students were to be involved with each of those two groups proceeding through Years 6, 7 and 8. Thus, the project, at the time of the data collection for this thesis, had a further year to continue through to its officially planned completion in 1993. By the end of 1992, the first group of students would end their planned involvement after having been QSC participants for three years (i.e. 1990-92).

Major restructuring of the Department of Education in Queensland was commenced throughout 1991, which impinged greatly upon the management and coordination of the QSC. However, despite some changes which threatened to end the life of the project throughout that restructuring, enough support was provided from Central Office and truth Coast Regional Office to assist in maintaining the project. However, the locus of control for the project moved substantially from Central Office to the South Coast Region in line with the principles underlying the restructuring process. In response to that shift in responsibility, the South Coast Region (in particular, the Deputy Executive Director, the Assistant Executive Director (Studies), the South Coast Regional Technology Reference Group, and the Gold Coast North School Support Centre) provided support for the QSC to continue throughout second semester of 1991 and throughout 1992. There was also an intention made by the South Coast Region to assist in ensuring that the QSC Project continued to its planned completion in 1993.

Project Management

5.2.1 What Was Intended in Terms of Program Management?

5.2.1a People

planning proposal (Vogler, 1989, p. 10), it was recognised that the QSC would
require special management arrangements in order to achieve its objectives having regard the diversity of educational, research and support interests represented by participating agencies. A Policy Group and a Steering Committee which consisted of the following membership was formed:

**Policy Group:**
- John Tainton, Assistant Director (Development and Portfolio Services), Department of Education, Queensland;
- Barry McGaw, Director, Australian Council for Educational Research; and
- Glen Evans, Professor of Education, University of Queensland.

**Steering Group:**
- Regional Director;
- Director, Division of Communication and Information Systems;
- Principals of the primary and secondary schools concerned;
- Member of the Faculty of Education, University of Queensland;
- Assistant Director, Curriculum Services;
- Project Director, Sunrise Central Group; and
- Primary and secondary project teachers" (Vogler, 1989, p.10)

The role of the Policy Group was to consider global issues such as project formulation and direction, resourcing and staff requirements, the project's progress, and cooperative contributions between project partners. The Steering Group was to be responsible for the coordination of the QSC implementation, while the day-to-day management was to be dealt with by the 'Project Leader' who would be required to report progress to the QSC Policy Group. The responsibilities of the Project Leader were to coordinate all aspects of project through consulting with the schools' administration, various Regional and central Office agencies, ACER, and the Faculty of Education at the University of Queensland.

In addition to the Policy Group, the Steering Group, and the Project Leader, other roles and actions were delineated for students' parents representatives, Learning Technology Service, Division of Schools, and the Sunrise Central Group (SCG) (Vogler, 1989, p. 12). The role and function of ACER and the University of Queensland were, at that time in late 1989, incomplete. Further project support, outlined in the early official planning document (Vogler, 1989, pp. 12-13), would be provided through the encouragement of parents, other students and teachers in the project school, and locan educational support personnel to
participate in discussions for assisting the Sunrise classrooms. Regional support teams are expected to attend meetings with the QSC teachers to offer support which teachers might require.

Accompanying research was to be formulated by the project partners. It was indicated at that time, that researchers and staff from ACER and the Faculty of Education at the University of Queensland would provide significant support for the research function. The research formulation was subsequently modified as ACER and the University of Queensland were no longer funded by the Department of Education after 1991. Their research roles were reduced and the Griffith University Gold Coast provided significant research support and coordination with the South Coast Region to enable the evaluation of the collection for this thesis to take place during 1992.

5.2.1B Equipment

Technological resources were a key element of the QSC Project plan as the "most important aspects of the Sunrise philosophy are concerned with developing a culture of learning in which activities help to develop the role of information technology as a special resource." (Vogler, 1989, p. 3)

'It was acknowledged that the only completely integrated technology-based environment developed for micro-computers was Logo. Logowriter was planned to be the main software used, with Boxer to be introduced later, subsequent to its development. Boxer, according to Vogler (1989, p. 5) would extend the capabilities of Logo and would provide more suitable user interface.

The resource requirements described the provision of personal laptop computer access for the student. Students were to use their personal laptop computers at school and at home. Criteria for the selection of those computers was outlined (Vogler, 1989, p.9). Additional technological resources were planned to be provided; i.e. printers, CD ROM, modem, synthesisers, and LEGO interfaces and kits.
159

5.2.1c Budget

An initial budget was proposed for $185,250 (Vogler, 1989, p. 13) which was to cover the salary for the Project Officer, contribution to the SCG, travel and accommodation costs for SCG staff and visiting support personnel, QSC Project Officer's travel and operating expenses, students' computer resources, additional classroom facilities, professional development workshops and teacher release, materials acquisition and development, and consultancy. Major responsibility for the provision of funding resided with Central Office, with some additional budgetary support (e.g. provision of TRS funding for teacher release and the provision of an extra teacher number) from South Coast Region. Schools were not required to provide either any funding or be involved in budgetary decision-making.

5.2.1d Training and Professional Development

Extensive inservice was planned for teachers on project principles, the intended computing environment, and familiarity with the technological resources at an initial training workshop to be held in November, 1989. During November and December of 1989, prior to QSC implementation in 1990, teachers were to develop, as a part of the inservice activities, a program for the beginning of 1990. An extra teacher was assigned to the QSC class for 1990, to enable flexibility for the organisation of professional development activities to be undertaken by the QSC teachers.

§ 2.2 What Happened in Terms of Program Management?

§ 2.2a People

The Policy Group and the Steering Group met throughout 1990 as planned. Representatives from the project partners, South Coast Regional representatives, and school representatives attended meetings held in Brisbane. Three teachers and the Year 6 students were selected as planned. ACER commenced the research program through the appointment of
Michael Ryan. However, the appointment of the Project Officer did not occur until May 1990. Ryan (1991, p. 45) observed that the Project Officer had a critical role to play in teacher support and that "the delay in appointment was to have a number of adverse effects." According to Ryan, they included:

- difficulties experienced by the teachers in the planning of innovative classroom experiences;
- problems in the design and coordination of a new approach to the official curriculum;
- coping with device malfunctions and inexperienced users;
- arranging the supply and maintenance of various goods and services; and
- the fundamental difficulty in interpreting practical plans from a poorly articulated project philosophy." (Ryan, 1991, p. 45)

Following the appointment of Greg Grimmett as the Project Officer, Ryan (1991, p. 45) noted that those issues were dealt with by the Project Officer in two ways - "through the negotiation of a more structured approach to planning; and in the provision of much needed moral support."

The number of teachers involved in the QSC Project increased in 1991 to include five teachers at Coombabah State School. The same Project Officer continued working with the QSC into 1991. However, during 1991, major personnel changes occurred at Regional and Central Office through the restructuring of the Department of Education in Queensland. This had major implications for the Policy Group and Steering Group as all of the representatives from Central Office and South Coast Regional Office were impacted upon by the restructuring. Some of those representatives had to seek newly created positions, while some chose to leave the Department of Education. By mid-1991, the Policy Group and Steering Group no longer existed and the management of the project was transferred to the South Coast Region.

The Project Officer left the project during mid-1991 for a short period throughout that transition. He returned to the project for the remainder of 1991. Throughout the transition period, personnel changes provided significant uncertainties about the future viability of the QSC. Personnel changes impacted upon the morale of the teachers, resulted in uncertainties about funding, and required a renewal of the program management and co-
A South Coast Policy Committee for the QSC Project was established and the first meeting of that group was held on 11 September 1991. The membership of that group became significantly different from the previous Policy Group. The membership of the newly formed QSC Policy Group reflected the regional ownership. Representatives were the Executive Director, South Coast Region, Senior Research Fellow, ACER (ACER continued the research through the work being coordinated by Dr Helga Rowe throughout 1991), Assistant Executive Director (Studies), South Coast Region, Principal Coombabah State School, Principal Coombabah State High School, and a QSC teacher representative. Neither the SCG nor the University of Queensland had any further direct QSC policy involvement.

As the transition process proceeded throughout 1991 and into 1992, school support centres were established, and revised regional roles, management structures and functions were formulated (South Coast Region, 1992). Those revisions were guided by the organisational principles from the Focus on Schools report (Department of Education, 1990). Of particular relevance to the QSC Project, a South Coast Regional Technology Reference Group was established to oversee major technology initiatives in the South Coast Region. Consequently, the QSC Policy Group became superseded by the newly formed group in late 1991. This group, which continued to operate throughout 1992, was chaired by the Deputy Executive Director, South Coast Region, and membership consisted of the Assistant Executive Director (Studies), South Coast Region, the Educational Advisers (Technology), School Support Centre Coordinators, Coombabah State School Principal, and a QSC teacher representative from Coombabah State High School. The researcher undertaking the evaluation study was also invited to attend meetings throughout 1992 to enable the presentation of progress research reports. ACER was no longer directly involved in 1992.

The conduct of the research undertaken in 1992 which is presented in this thesis was facilitated by the provision of a research scholarship by the Study and Research Assistance Scheme of the Department of Education, Queensland to Glenn Finger, the Deputy Principal of Coombabah State School was appointed as the researcher to undertake the QSC Evaluation which is presented in this thesis.
Since the project's conception, significant personnel changes had occurred. Whilst the Project continued throughout 1992 and there had been little change in the composition of the QSC students, the management structure and coordination underwent major changes. Those changes which included the non-reappointment of a Project Officer, ACER and the University of Queensland no longer being active project partners, and the SCG no longer directly liaising with the QSC, reflected significant differences between the initial intention and what happened. Support for the QSC came from within the schools and within the South Coast Region. This was found to have resulted in feelings among the teachers and schools' administration that due to the QSC losing its original parents, the schools had been required to adopt its ownership without appropriate leadership, coordination and support.

Equipment

Asaba 1000SE laptop computers were chosen for the project. At the commencement of the QSC Project in 1990, 30 students had their own laptop computers, and a further 30 students shared fifteen computers. Additional classroom facilities were also acquired as needed; i.e. CD Rom unit, large desktop computers, printers, scanner, modem, telephone correction, and LEGO kits. A site licence for Logowriter and some additional software was purchased. In addition, security was installed in the QSC classroom in 1990.

A decision was made in November 1990, at a meeting involving the Project Officer in consultation with QSC teachers that the provision of computers would be increased to allow all students in 1991 to have their own personal laptop computer. That decision resulted in there being almost 120 laptop computers being used by almost 120 Year 6 and Year 7 students in 1991. That level of resourcing had been maintained in 1992, although there had been some computers 'written off' due to the high cost of repairs quoted for those computers. Figure 5.4 displays information which indicates that nearly all QSC students used a computer for their own use. Furthermore, Figure 5.5 shows that most QSC students used their computers at both school and at home. Surprisingly, five girls and one boy in Year 8 indicated that they used their laptop computer only at home. Informal classroom
Observations and discussions with some of the Year 8 teachers revealed that those students own laptops. Indeed, it was mandatory for the completion of many set tasks. Students were also asked to estimate the proportion of the school day in which they used their technological resources in the classroom. While only 2% of Year 7 students either did not use technological resources at school or used them to a very little extent, 19% of Year 8 boys and 23% of Year 8 girls indicated that they did not use technological resources at all or used them to a very little extent as shown in Figure 5.6.

![Figure 5.4: Student Access to Laptop Computers](image)

![Figure 5.5: Location of Student Use of Laptop Computers](image)
The provision of the technological resources represented a significant capital outlay. Together with the funding for other contingencies such as professional development, project planning, ACER research costs, Project Officer salary, and consultancy, the total funds invested in the QSC Project through 1990 and 1991 was over $290,000. What happened in terms of resource acquisition more than matched the intended resourcing levels outlined in the planning document (Vogler, 1989). The consequent funding was considerable due mainly to the expansion of the QSC Project in 1991. The budget requirements for the QSC Project for Semester 1, 1991 was $212,642.50. In addition to the initial establishment costs in 1990, funding was sought and obtained for the purchase of an additional 75 Toshiba S1100E laptop computers at a total cost of $98,625. Submissions for those funds and the execution and management of that QSC budget was largely the responsibility of Learning Technology Services located within the Central Office of the Department of Education, Queensland. The Project Officer performed a major role in submission writing and the day-to-day implementation of ordering equipment and materials, arranging repairs, and coordinating payments for professional development activities.

Neither the schools nor the region during 1990 and Semester 1 1991 had any direct control over the budget. As the Project proceeded, funding issues and decisions about the project...
devolved to the South Coast Region and to the schools involved. However, funding constraints and uncertainties emerged throughout 1991 as ownership of the project became devolved from Central Office. The QSC Project operated throughout the 1991-92 financial year on contingency funding of $50,000. By the 13 May, 1992 that contingency funding had been exceeded by more than $8,000. There was concern within the schools that even basic repairs could not be funded and that the QSC might not continue. Senior South Coast Regional Officers provided significant support at that stage and further funding was allocated to ensure that the project could be maintained. An important meeting was coordinated by the Gold Coast North School Support Centre Coordinator on 28 May, 1992. QSC teachers attended that meeting. A major purpose of that meeting was for the teachers to establish a budget required for the QSC Project to continue throughout 1992 and 1993. Subsequent to the submissions made by teachers from that meeting, the South Coast Regional Technology Reference Group instigated the formulation of a submission for further funds to enable the QSC Project to continue in 1993.

12.2d Training and Professional Development

During the commencement of the project in 1990, Ryan (1991, p. 50) drew attention to the importance of access to broad professional support for teachers who were involved in innovation. Analysis is presented here of the access teachers had to that support. While this section focuses on training and professional development, the investigation of support for teachers discovered that teachers also required moral support as well as technical and professional support. Sources of that leadership and support are discussed.

Ryan was highly critical of the lack of professional support early in the QSC implementation. He reported that:

"To begin a major innovation without such support, as occurred in this project, is to repeat the mistakes that have plagued many innovative projects in instructional technology. The teachers became quickly overwhelmed with difficult planning and management issues and coped by using unproductive mechanisms". (Ryan, 1991, p. 50)

Ryan referred to that approach as the deep-end philosophy which guided early implement-
and suggested that "one manifestation of the deep-end philosophy is the well-documented gap between expressed goals and implementable practice" (Ryan, 1991, p. 192). The lack of support for teachers was such that Ryan even assisted in the conduct of sessions with teachers to help them resolve technical and educational difficulties posed by the technological resources. However, following the arrival of the Project Officer, a program of professional development for the QSC teachers at Coombabah State School was developed. Specific sessions and courses were devised to provide assistance for teachers with:

- general classroom management strategies;
- basic knowledge of the disk operating system for the laptops;
- organisational techniques for computer files and disks;
- constructs and programming in Logo; and
- classroom use of Lego control devices." (Grimmett, 1990, p. 2)

An inservice program was organised which enabled the QSC teachers to participate in a rich program of professional development activities throughout 1990. The Project Officer noted that by July 1990, the teachers were becoming more reflective about their classroom practice and had become better able to incorporate advice from the specialists which he had made available to them (Grimmett, 1990, p. 3). Moreover, he noted that the classroom culture had become more inquiry-oriented, and that the QSC teachers were displaying greater confidence in their ability to use the learning technology to enhance the employment of more effective learning and teaching strategies. The role played by the Project Officer was critical in providing technical, professional, and moral support for the teachers.

A similar program of professional development proceeded throughout 1991 with the Project Officer being the key facilitator of that program of professional development. As a result of the QSC experiences in using laptop computers, a report titled Using Laptop Computers in Schools (Department of Education, Queensland, 1991c) was compiled by the Project Officer. That report made the distinction between the training and professional development of teachers in using computers. According to that report, training referred to the skills required to make teachers competent users of the technology, while professional development referred to the approaches necessary for teachers to successfully incorporate
technology into the classroom experiences of their students. Two reasons were cited for making that distinction. Firstly, training and professional development were different, and, secondly, that the QSC experience had strongly shown that they should not be undertaken together (Department of Education, Queensland, 1991c, pp. 5-6). The report argued that:

"Teachers need time to meet all of the problems involved in the use of technological tools (copying files, adding graphics, crashing disks, losing files, controlling printers, etc.) prior to facing the avalanche of problems which can result from introducing a number of computers into the classroom of students." (Department of Education, Queensland, 1991c, p. 6)

The necessary training which Ryan (1991) identified had been largely missing in the early stages of the project was present throughout most of 1991. However, due to the Project Officer not being appointed for 1992, the teachers at the secondary school received only several days of inservice in December, 1991. The secondary teachers throughout 1992 had experienced similar problems to those observed by Ryan of the teachers in early 1990. The QSC teachers at Coombabah State High School expressed criticisms about the lack of access to appropriate leadership, support, and inservice. One of the secondary teachers, when asked what had been the strengths of the project management indicated that he didn't perceive that there had been any project management at all. Moreover, one of the key secondary administrators who had shown interest in the QSC Project also was critical of the lack of management in making the transition to Year 8 in 1992. He stated that:

"The non-replacement of the Project Officer appears to have left the project without an overview of direction, with problems of negotiation between departments (especially budget) leading to serious doubts among staff as to the future viability of the project, their personal value to the project and their future tenure details.

A common comment from staff also seems to be their displeasure at the number of times they have been asked to provide the same information for various reasons. They feel they have covered the same ground repeatedly. This would seem to indicate a lack of coordination/loss of information/communication/reticence to take responsibility or .............. (unknown) within the project." (Head of Department, May, 1992)

Therefore, not only was the lack of training and professional development a concern for the secondary school QSC teachers in 1992, but there also existed a lack of cohesive, effective project management and coordination. Informal discussions with the secondary teachers and comments made by them at meetings suggested that, while they had been interested
to participate in the QSC Project, they felt that they had been left to fight for the project's survival. They believed that was not an appropriate role for them to play in their first year of involvement as they were still asking questions about the project's philosophy, rationale, and goals. The strategic planning, management and support necessary to maximise the secondary teachers' training and professional development was missing.

The lack of support for the secondary teachers in 1992 was further exemplified by the contrasting indications from the primary teachers and the secondary teachers when asked about the personnel who had provided them with leadership and support. The teachers and administrators at Coombabah State School listed twenty-one people whom they perceived had provided them with leadership and support. The secondary teachers only listed eleven people. Of those eleven people, six of them were teaching colleagues, and a further three listed were the former Project Officer and two lecturers from Monash University (Dr Anne McDougall and Jeff Richardson) with whom they had worked briefly for several days in late 1991. Professor Richard Smith from Griffith University Gold Coast was listed by one of the teachers who was undertaking postgraduate work with Richard.

The following were responses from teachers:

**Greg Grimmett**  Project Officer 1990 - 91
"Introduction to project philosophy, research material." (Year 8 QSC Teacher, May, 1992)
"Inservice (Dec '91)." (Year 8 QSC Teacher, May, 1992)
"Organised Logo inservice with Monash Uni. staff." (Year 8 QSC Teacher, May, 1992)

**Dr Anne McDougall**  Lecturer, Monash University
"Inservice training in Logowriter. (This was invaluable)" (Year 8 QSC Teacher, May, 1992)

**Jeff Richardson**  Lecturer, Monash University
"Inservice training in Logowriter. (This was invaluable)" (Year 8 QSC Teacher, May, 1992)

**Professor Richard Smith**  Griffith University Gold Coast
"Advice and information." (Year 8 QSC Teacher, May, 1992)

There was little indication from the secondary teachers of any planned, strategic project support either from their school administration or from Departmental support from outside of the school. One teacher indicated that the Head of Department (Mathematics) had assisted in coordinating the secondary school staff. However, they named other QSC
Teachers as their main sources of support; viz.

Dave Mitchell, Zoe Schalch, Dave McGuren, Mike Hawney, and Julie Hammett QSC Teachers at Coombabah State High School
"They've taught me everything I know." (Year 8 QSC Teacher, May, 1992)

Dave Mitchell QSC Teacher 1990-92
"Background, philosophy, in class help, technical help." (Year 8 QSC Teacher, May, 1992)
"General advice on the operational issues associated with Sunrise. Assistance with ordering and purchasing. Technical advice that has assisted in gaining best value for money for repairs." (Year 8 QSC Teacher, May, 1992)

Zoe Schalch QSC Teacher 1991-92
"Team type teaching." (Year 8 QSC Teacher, May, 1992)

Karen Hallett QSC Teacher 1990-92
"Observation, discussion, sharing ideas/projects." (Year 8 QSC Teacher, May, 1992)

Mike Hawney QSC Teacher 1992
"Ideas/project sharing brainstorming." (Year 8 QSC Teacher, May, 1992)

In stark contrast, the primary QSC teachers and administration indicated a broader range of support emanating from Central Office and South Coast Region, school administration, ACER, and Monash University. Central Office and ACER leadership was perceived to have been evident at the commencement of the project with Laurie Vogler and Liddy Nevile seen as key personnel in the conception of Sunrise; e.g.

Laurie Vogler Project Leader - Central Office 1989-1991
"Initial setting up of the project. Guidance with curriculum and planning." (Year 7 QSC Teacher, May, 1992)
"Original concept formation." (Year 7 QSC Teacher, May, 1992)
"Administrative assistance." (Year 7 QSC Teacher, May, 1992)

Liddy Nevile ACER consultancy to Department of Education, Queensland 1990
"Some Logo ideas, personal support, some planning advice, introduced us to others." (Year 7 QSC Teacher, May, 1992)
"Original concept formation." (Year 7 QSC Teacher, May, 1992)
"A Sunrise Centre in which to operate." (Year 7 QSC Teacher, May, 1992)

South Coast Regional support was also identified which reflected the transition which occurred in ownership of the project and through changes in senior personnel at the regional level. The primary teachers listed the following personnel; viz.
The QSC teachers indicated that they perceived on-site visits by those officers to see what was happening in the QSC classrooms as important. The QSC teachers, for example, were encouraged by the compliments expressed in a letter (dated 20 March 1991) which was sent to the Project Officer from Tom Birtwistle following a visit to the school. The following is an extract of that letter:

"Keith Bryant, Assistant Regional Director, South Coast Region and I visited the Sunrise Centre at Coombabah State School on Friday 15 March 1991.
...the teachers and pupils showed us a sample of some of the work that has been accomplished at the Sunrise Centre.

Both Keith and I would like to say, Greg, that we were most impressed with the progress and changes that have occurred not only in the teachers’ classroom management and attitudes but also in the learning outcomes of the pupils. ...I thank you for your involvement."

Similarly, the school administration at Coombabah State School was also perceived by the teachers to have provided leadership and support. Teachers, when interviewed, strongly argued that they felt that it was important that their work was valued by their administration and by senior Departmental Officers. A teacher expressed that the interview itself had provided her with a personally beneficial emotional experience through which she had been given the opportunity to state freely her feelings about her project involvement. The QSC teachers had worked in a high-risk environment and consequently sought regular affirmation of the viability of the project, assurances that they were "heading in the right direction", and required moral support as well as technical and professional support. As the school administration and the Project Officer had been close to the QSC teachers in their day-to-day work, teachers saw those personnel as key support figures for confirming their efforts. A teacher even referred to the Project Officer as a ‘minder’ and ‘father figure’. The following statements from teachers provided evidence of the importance of that administrative support:

Robin Ramsbotham Principal, Coombabah S.S. 1989-92

‘Helped with parent meetings and most workshops. Maintained strong ultimate school responsibility for the project. Represented the project at Regional Office and Central Office meetings"
Helped some teachers to obtain support to go to ACEC in 1992.” (Year 7 QSC Teacher)

**Glenn Finger**  Deputy Principal, Coombabah S.S. 1989-92

"Interest and enthusiasm in all aspects of the project. Participated in workshops and ran inservice where possible. Fought for all initiatives and supported teachers at all stages. Met with Project Officer on weekly basis in 1991 to plan strategically. Also worked to familiarise parents with the project at all times. Helped organise the selection of students into project." (Year 7 QSC Teacher, May, 1992)

"Enthusiasm for the project. Support and encouragement at all times. Excellent advice in administration areas." (Year 7 QSC Teacher, May, 1992)

"Being prepared to work with the project, sustain initiatives, etc." (Year 7 QSC Teacher, May, 1992)

"Professional and moral support." (Year 7 QSC Teacher, May, 1992)

"Confident/effective school manager." (Year 8 QSC Teacher, May, 1992)

**Greg Grimmett**  Project Officer 1990-91

"Supported us in all areas - curriculum development, care of resources, purchase of equipment, represented us at Regional and Central Office level meetings, organised inservice. General 'minder' and 'father' figure." (Year 7 QSC Teacher, May, 1992)

"Inservice of software that was to be used (Logo, WordPerfect, Works). Moral support and encouragement at all times. Guidance in all areas - personal and professional." (Year 7 QSC Teacher, May, 1992)

"Transference of concept to practice. Logistical support." (Principal, May, 1992)

"Stocktake." (Registrar, May, 1992)

"Crucial co-ordination, provision of professional development, FUNDING arrangements." (Year 8 QSC Teacher, May, 1992)

The primary school QSC teachers also named their teaching colleagues as sources of support in assisting with their training and professional development. Teaching colleagues as a source for teaching ideas, strategies, and professional discussions cannot be underestimated as shown by the following teacher responses. Many effective training and professional development activities were classroom-based and involved planning discussions with teaching colleagues.

**Karen Hallett**  QSC Teacher 1990-92

"Advice, encouragement and support in all areas." (Year 7 QSC Teacher, May, 1992)

**Jenny Betts**  QSC Teacher 1990-91

"Personal backup and expertise with Logo. Modelled good teaching practices in the classroom. Inserviced the team at particular times." (Year 7 QSC Teacher, May, 1992)

"Invaluable assistance with Logo and classroom strategies. A great role model for any teacher." (Year 7 QSC Teacher, May, 1992)
Dave Mitchell  QSC Teacher 1990-92
"Personal backup and expertise with Logo. Worked hard to learn how to manage the different pieces of hardware and the different software packages. He was always helpful whatever the problem. Inserviced the 'team' in various areas of software." (Year 7 QSC Teacher, May, 1992)
"Excellent advice in Maths area of Logo. Great assistance with maintenance." (Year 7 QSC Teacher, May, 1992)

Barbara Macfarlane  QSC Teacher 1991-92
"Personal backup and expertise with software packages. Willingness to be flexible in a cooperative teaching situation has been of incredible help to me personally." (Year 7 QSC Teacher, May, 1992)

Karen Hallett, Jenny Betts, Dave Mitchell, Zoe Schalch, and Barbara Macfarlane  QSC Teachers at Coombabah State School
"A supportive school environment."(Year 7 QSC Teacher, May, 1992)
"A professional group of teachers." (Principal, May, 1992)
"Being prepared to put in the extra effort, suffer the stress, etc." (Year 7 QSC Teacher, May, 1992)

Inservice activities and sources of support for the QSC teachers at Coombabah State School were derived from Educational Advisers and tertiary education lecturers; viz.

Bev Pacey  Educational Adviser
"Inservice at various times. Participation in the project when possible." (Year 7 QSC Teacher, May, 1992)

Bob Rogers  Educational Adviser
"Setting up of hardware in the initial stages of the project. Willingness to fix hardware at a moment's notice. Inservice in WordPerfect."(Year 7 QSC Teacher, May, 1992)
"Technical support in early days of the project." (Year 7 QSC Teacher, May, 1992)

Dr Anne McDougall  Lecturer, Monash University
"Inservice for a week in Logo. Enthusiasm for the project at all times."(Year 7 QSC Teacher, May, 1992)

Jeff Richardson  Lecturer, Monash University
"Inservice for a week in Logo. Lecturer for Graduate Diploma in Computers in Education. Enthusiasm for the project and offered to be available at any time if we needed help." (Year 7 QSC Teacher, May, 1992)

Some of the QSC teachers had participated in State, national, and international conferences about computers in education. That participation included the presentation of papers based upon their QSC experiences at many of those conferences. In addition, six of the QSC teachers had commenced tertiary study programs directly related to educational computing. Despite some of the limitations and shortcomings of the training and development
as sources of professional support, the involvement of the teachers in the QSC Project nurtured a commitment on the part of the teachers to pursue personal programs of professional development which was largely classroom-based and for many of them was complemented by formal tertiary studies in educational computing. Moreover, some of the teachers made significant contributions to the professional development of others through publication, presenting papers at conferences, active participation in computer user networks, and providing school-based inservice workshops.

To further illuminate project management issues, the QSC teachers, school-level administrators, and the former Project Officer were surveyed and interviewed to gain their perceptions about the strengths and weaknesses of the project management employed. The subsequent discussion provides a summary of the analysis of their responses. Following the presentation of their perceived strengths and weaknesses of the project management, applications for managing further technology initiatives in schools are drawn from the participants’ insights gained through their involvement in the QSC Project.

3.3 Strengths of the Project Management

The perceived strengths of the QSC project management related strongly to the appointment of and the role played by the Project Officer. All of the personnel who had been involved throughout the first two years of the project suggested that the role played by the Project Officer was critical. The secondary teachers who had not had the support of a Project Officer throughout 1992 saw that as being a major weakness of the project management in 1992. The following statements by teachers about the strength of the project management prior to 1992 indicated the perceived importance of the Project Officer:

"Project Officer - undoubtedly the greatest single factor in the functioning of the project." (QSC Teacher, May, 1992)

"Having had a Project Officer who was able to manage and educate a group of people who had limited skills into a team who have developed some expertise in the area of information technology." (QSC Teacher, May, 1992)

"Major commitment to personal skills of those involved, especially inservice to teachers and provision of highly skilled project officer." (Principal, May, 1992)
"Greg Grimmett - wondrous knowledge and personal support to the teaching team and his communication with all levels of school personnel about the project - quite outstanding." (Deputy Principal, May, 1992)

"Prior use of a project coordinator seemed very useful. Someone to help all participants to focus on the project. Coordinate activities between Regional Office and schools involved." (Registrar, May, 1992)

The personal and professional commitment of the QSC teachers was also seen as being a strength of the project (Finger, 1992, p.133). Ultimately, the success or failure of the QSC was dependent upon the commitment of the teachers. Teachers indicated that they spent many hours during evenings, weekends, and school holidays when they planned lessons, solved software problems, examined students' work, and overcame technical difficulties. Those teachers with families stated that their spouses occasionally asked them if all teachers had to do what they did. There were clearly additional demands made on those teachers involved to which they responded with high levels of commitment. That commitment was evident in teachers' expressions of it being viewed as a strength of the project:

"Personnel involved - Some very dedicated and professional staff at the school and at regional office level.″ (QSC Teacher, May, 1992)

"Commitment of staff involved to the project" (Greg Grimmett's role). (QSC Teacher, May, 1992)

"Excellent school and classroom staff have ensured that students have enjoyed maximum benefit." (Former Project Officer, May, 1992)

In addition to the role of the Project Officer and the commitment of teachers, other perceived strengths of the project were the initially generous budget, having an extra teacher assigned to the project, administration with faith and confidence in the project, and the use of Logowriter as the main tool of enquiry for the children.

5.2.4 Weaknesses of the Project Management

The non-replacement of the Project Officer, lack of continuity in Departmental support, inadequate teacher inservice, uncertainty about funding and the future of the project were perceived by the teachers and school administration to be the most serious weaknesses of the project management (Finger, 1992, p.133). Moreover, these were found to interrelate.
Without the existence of a Project Officer, for example, there had been little tangible evidence of any strategic coordination and formulation of project direction, funding, and teacher inservice during most of 1992. This had particular impact on the secondary teachers who sought clarification of the project rationale and required high initial inservice. In contrast, the primary teachers were familiar with the project rationale and had been involved in extensive training and professional development activities while the QSC Project Officer was involved. For the primary school QSC teachers, the context within which they operated during 1992 was largely consolidation and further exploration rather than the significant transformational changes in classroom operation which they had experienced throughout 1990 and 1991. Teachers highlighted their concerns about not having a Project Officer:

“Losing Project Officer - this meant many duties were passed onto the teachers and increased an already heavy workload.” (QSC Teacher, May, 1992)

“No provision for Project Officer role in first term 1990. Not reappointing Project Officer for 1992. It had already been shown there was no one capable of filling this position as well but we should have someone ‘to go into bat for us’.” (QSC Teacher, May, 1992)

Uncertainties about funding were linked with the dislocation in ownership of the project. During late 1991 and 1992, funding concerns and the restructuring process resulted in the administration and teachers at the two schools being unsure that the project would proceed to its planned conclusion. It was through increasingly stronger South Coast regional ownership and support that the project was maintained throughout 1992. More strategic program management emerged which aimed to enable the project to continue in 1993. However, teachers referred to that discontinuity between ownership and funding issues as project management weaknesses:

“Lack of consistency with the same people involved at the regional level, The budget was never defined or sure. It needed to be a more concrete thing.” (QSC Teacher, May, 1992)

“Lack of continuity in Departmental support - consequently morale/decision making problems Inadequate communication between staff in the project and Departmental Officers responsible for the project. Uncertainty - Is there a budget? - Who is in charge? - Is the project on-going?” (QSC Teacher, May, 1992)

“No one has ownership - all agree to support the project but the bottom line is funding - we have
not been able to get guarantees.” (QSC Teacher, May, 1992)

“The unsureness of enough financial support to sustain the project as initially expected. It has been “unsure” for at least a year now and that is too long.” (QSC Teacher, May, 1992)

“External changes (Regional transition, restructuring, etc) have been allowed to impinge upon the project’s operation.” (Project Officer, May, 1992)

Having examined project management in terms of what was intended and what happened, and gained insights from the key participants of their perceptions of the strengths and weaknesses of the QSC project management, implications can be drawn from that evaluation. Those implications are discussed in the next section.

12.5 What Are the Implications for the Management of Further Initiatives to Integrate Learning Technology in Schools?

Based upon their QSC experiences, the schools’ administration, QSC teachers, and the former Project Officer were asked to indicate what they believed were essential strategic elements necessary for maximising the successful establishment, maintenance, and institutionalisation of learning technology initiatives in schools. The important implications which emerged from their responses and from the preceding analysis of the strengths and weaknesses of the project management were able to be categorised according to four areas, as displayed in Table 5.4 - personnel, resources, budget, training and professional development.

Personnel, resources, budget, and training and professional development issues were found to interrelate. Uncertainties and problems associated with one of those planning components was found to produce changes in another component. In particular, this section of the analysis of the management of the QSC Project highlighted the importance of the human resources dimension of project management. While the project had a focus on technological resources through the establishment of special learning environments in which the students and teachers accessed computers of their own, evidence emerged which suggested that the roles played by people had been substantially more influential in determining the success or otherwise of the project. Changes in Central Office personnel,
example, influenced funding mechanisms. Funding decisions, in turn, were essentially critical for resourcing levels in the QSC classrooms. Uncertainties about funding for computer repairs and maintenance of the resource base was found to affect the morale of the QSC teachers during 1992. The nature and extent of the training and professional development activities was also impinged upon by changes in personnel, budget, and the resources. Due mainly to the non-reappointment of the Project Officer in 1992, the training and professional development program of the secondary teachers had been severely limited.

### Table 5.4: Strategic Elements for Project Management

<table>
<thead>
<tr>
<th>Personnel:</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;A coordinator who keeps the project together.&quot; (Teacher)</td>
</tr>
<tr>
<td>&quot;In the future schools will need a resident computer technician!!&quot; (Teacher)</td>
</tr>
<tr>
<td>&quot;Guaranteed involvement of all personnel for the entire program.&quot; (Deputy Principal)</td>
</tr>
<tr>
<td>&quot;Personnel to remain constant.&quot; (Deputy Principal)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Resources:</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Maintenance/Management of resource base.&quot; (Project Officer)</td>
</tr>
<tr>
<td>&quot;Convenient access to computers, etc in significant blocks of time (it is perhaps not necessary that students be able to take computers home with them and desktops may be seen as more desirable by some).&quot; (Head of Department)</td>
</tr>
<tr>
<td>&quot;Equality of resources - equal access for all students and teachers - ESSENTIAL.&quot; (Deputy Principal)</td>
</tr>
<tr>
<td>&quot;An adequate level of technology. At least one computer per four students.&quot; (Principal)</td>
</tr>
<tr>
<td>&quot;A good supply of laptops, printers, desktops, scanners, etc.&quot; (Teacher)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Budget:</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Sufficient funds.&quot; (Deputy Principal)</td>
</tr>
<tr>
<td>&quot;Sufficient funds to support all aspects of the program and further initiatives that may develop from the program.&quot; (Deputy Principal)</td>
</tr>
<tr>
<td>&quot;Realistic levels of funding based on informed forecasts. Included should be a component to cater for regular (a) updating of equipment and (b) repairs.&quot; (Registrar)</td>
</tr>
<tr>
<td>&quot;Money - money - money!&quot; (Deputy Principal)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Training and Professional Development:</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Ongoing professional development programs for teachers.&quot; (Deputy Principal)</td>
</tr>
<tr>
<td>&quot;Development/ training of teachers so this is ongoing.&quot; (Registrar)</td>
</tr>
<tr>
<td>&quot;1. Teachers need time to feel comfortable with the technology. 2. Need initial training and support.&quot; (Teacher)</td>
</tr>
<tr>
<td>&quot;Staff fully trained in information technology.&quot; (Head of Department)</td>
</tr>
<tr>
<td>&quot;Effective professional development of school admin. team and teachers.&quot; (Project Officer)</td>
</tr>
<tr>
<td>&quot;Inservice of teachers to a stage where they can integrate technology to meet curriculum demands.&quot; (Principal)</td>
</tr>
</tbody>
</table>
The implication is that any future project planning needs to consider personnel, resources, budget, and training and professional development issues to ensure that effective structures exist. Within those broad issues, more specific project management decisions can be formulated which involve the key participants in project decisions to facilitate their ownership of the project's educational rationale and its activities. In that way, for example, teachers and the schools' administrations could participate in budget formulation and monitoring of project costs to enhance the match between prioritising resource acquisition and the pursuit of the educational objectives of the project.

Conclusion

This chapter has presented the findings and results of a situational analysis of the project and analysis of the project management. The 'official' view of why the QSC Project was established and the project's goals were described and then analysed through examining participants' views. All of the QSC teachers and the schools' administration members found to believe that the QSC was unique when compared with other computer initiatives in schools. The project's setting and context, participants, history and future plans were described and reviewed.

Findings were reported about the management of the project in terms of people, equipment, money, and training and professional development through the comparison of information about what was intended and what happened. Significant personnel changes had occurred through the restructuring of the Department of Education in Queensland. Despite changes which threatened the life of the QSC Project, the ownership and management of the project has moved successfully, although with some trepidation, from Central Office to the South Coast Region and the schools involved. There were challenges such as funding uncertainties and the provision of school-based and region focused leadership of the project's management that emerged as a result of that transition. Those challenges were found to be addressed more as the project proceeded throughout 1992.
From the analysis of the participants' perceived strengths and weaknesses of the QSC project management, and from their suggestions for successful project planning, four issues were identified. Those four issues which need to be addressed carefully to maximise the success of future learning technology initiatives in schools were personnel, resources, budgets, and training and professional development. It was suggested that those issues need to be examined through an approach which complemented the development of an educational rationale for the planned project. Inherent in that planning should aid the involvement of the key participants of that learning technology initiative (e.g. the school's administration and teachers) to enhance their ownership of and commitment to the particular project.