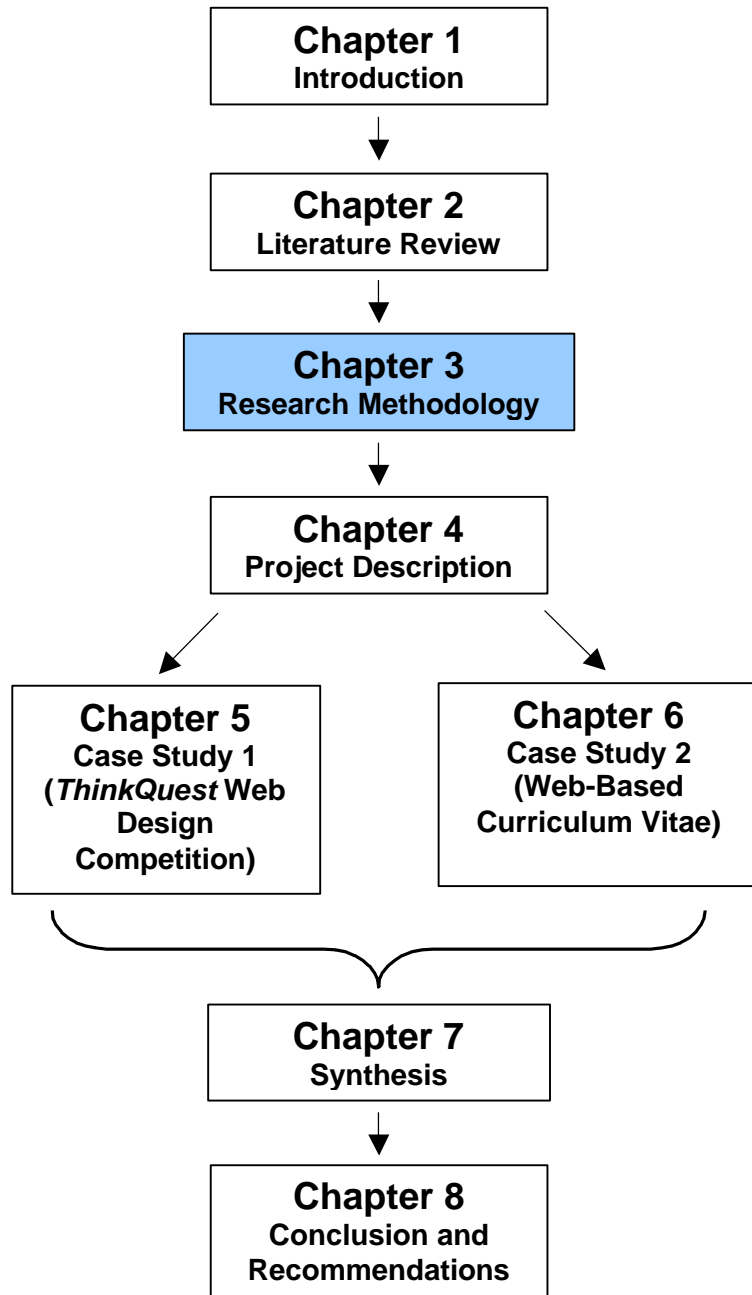


## Chapter 3



## Chapter 3 Research Methodology

### 1 Introduction

This chapter describes the methodology used, the stages of the research and measures taken in order to ensure validity and reliability.

### 2 Epistemology

This research follows the action research process and a case study methodology:

- Action research is intended to produce both change (action) and understanding (research) (Dick, 1997, online) and uses progressive cycles (Robertson, Trotman & Galbraith, 1997, p. 22).
- A typical case study approach is one in which a single bounded or limited (Merriam, 1998, p. 27) case is studied in depth as it occurs in a natural situation, and the data consists of rich verbal descriptions (McMillan & Schumacher, 1993, p. 37).

The following topics describe the joint action research process and case study approach based on Dick, McMillan and Schumacher and Merriam.

#### 2.1 Methods

The methodology followed, namely repeated cycles of plan and action, data collection, analysis and reflection, and data redefinition, lead to improved information processing in the digital information environment. The data and interpretations were adequately validated and authenticated using the cycle methodology by participant verification and peer review.

#### 2.2 Participants

The participants in the research, the learners, took part in the case studies. They did the work, completed the questionnaires, and then checked the data collected and the interpretations. Whole classes were used for the research: no learners were deliberately excluded in the specific classes that completed the case studies. Three of the six classes participated directly in the research with all the classes acting as

context for the research problem. The participants are described in this thesis where it is relevant, tabulated in Table 3 - 1.

**Table 3 - 1 Location of description of participants**

Chapter	Section	Type of description
4	4	Computer Studies SG learners in Grades 10-12: <ul style="list-style-type: none"> <li>• Subject choice of the A and D groups</li> <li>• Gender, racial and academic performance distributions</li> <li>• Ownership of and ability to use digital equipment</li> </ul>
5	2	Learners in Grades 10D and 11D who took part in <i>ThinkQuest</i> web design competition: <ul style="list-style-type: none"> <li>• Gender and racial distribution</li> <li>• Distribution of learners who completed their web entries in time</li> <li>• Ownership of and ability to use digital equipment</li> </ul>
6	2	Learners in Grade 11A and 11D who created web-based CVs: <ul style="list-style-type: none"> <li>• Gender and racial distribution</li> <li>• Distribution of learners who completed their web entries in time</li> <li>• Ownership of and ability to use digital equipment</li> </ul>

## 2.3 Literature

The literature was consulted to provide the background to the subject and to identify a problem which had not been covered (Merriam, 1998, p. 53). The literature review was written up in themes relevant to the study (Merriam, 1998, p. 55).

The literature was consulted to investigate how learners interact with information in a digital information environment. After the first case study, the data from the literature was found to be inadequate and the second case study or action cycle was implemented. The literature was continually consulted to try to find a better way of getting the learners to interact with information in a digital environment.

Case study and action research literature was consulted in an endeavour to find a way of describing how learners interact with information in a digital environment. The solution to the research problem 'How South African Further Education and Training learners acquire, recall, process and present information in a digitally enabled environment?' was a set of case studies in a natural situation against a background of usual class activities, using the action research methodology to compare the data collected in every cycle with that from the initial literature review and then finally synthesising them into one profile of how learners interact with information in a digitally enabled environment.

## 2.4 Cycles

There were two iterations of plan and action, data collection, analysis and reflection, and data redefinition. Each case study was a bound unit within the scope of usual class work. The two iterations lead to a clearer understanding of the research problem.

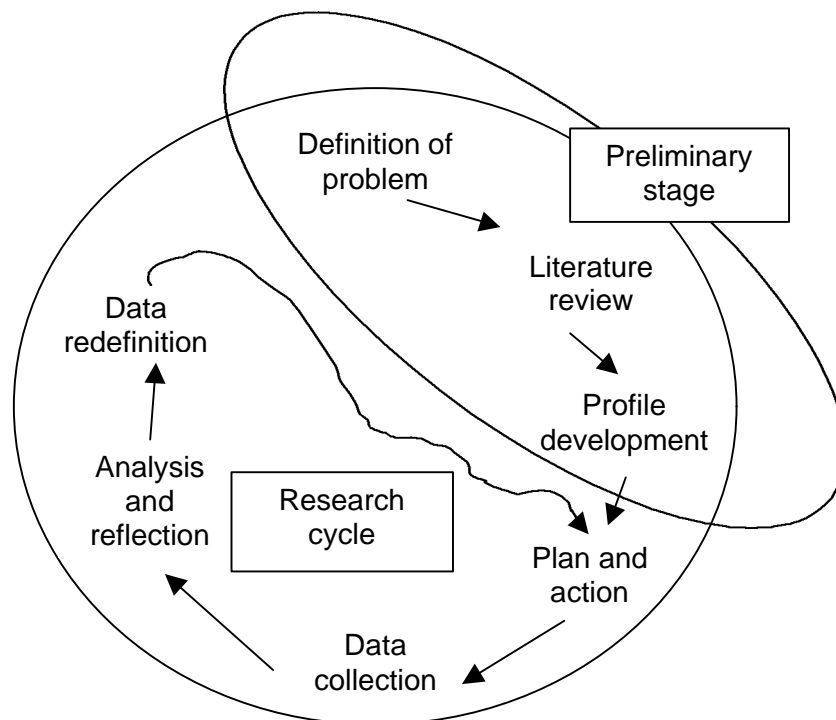
## 2.5 Documentation and reporting

The data collected by observation and description in the case studies is corroborated by facts and figures and statistically illustrated in charts and tables. The profiles of how the learners interact with information, gleaned from the literature review and the case studies, are tabulated and comparisons are made at the end of every case study and synthesised at the end of the thesis.

## 3 Stages of the research

The research followed the stages illustrated in Figure 3 - 1 and described in Table 3 - 2: Preliminary stage, Cycle 1 and Cycle 2.

**Figure 3 - 1 Stages of the research**



**Table 3 - 2 Stages of the research**

Stage		Activity
Preliminary stage	Definition of problem	<ul style="list-style-type: none"> <li>Problem recognised in 1997: Learners at Pinelands High School (PHS) in Computer Studies Standard Grade (SG) interacted with information in the digital environment in a different way to that of the usual 'chalk and talk' classroom.</li> </ul>
	Literature study	<ul style="list-style-type: none"> <li>The Nexus database search revealed nothing with respect to the information processing of South African learners in a digital environment.</li> <li>A literature study was undertaken to find out what has already been written in the field of information processing by FET learners in a digital educational environment.</li> </ul>
	Profile development	<ul style="list-style-type: none"> <li>On completion of the literature study, a profile of the South African FET learner in a digital educational environment was developed, demonstrating how the learner interacts with information from cognitive, affective and physical perspectives.</li> </ul>
Cycle 1	Plan and action	<ul style="list-style-type: none"> <li>Learners given usual class activity, Case Study 1, to complete.</li> </ul>
	Data collection	<p>On completion of Case Study 1</p> <ul style="list-style-type: none"> <li>Learners completed a questionnaire, eliciting their responses to topics raised in the literature study.</li> <li>Data collected by examining the product created in Case Study 1.</li> <li>Learners observed.</li> <li>Event log kept.</li> <li>Parents interviewed.</li> </ul>
	Analysis and reflection	<ul style="list-style-type: none"> <li>Data collected in Case Study 1 analysed on the basis of the profile developed in the literature study.</li> </ul>
	Data redefinition	<ul style="list-style-type: none"> <li>Data collected in Case Study 1 redefined.</li> </ul>
Cycle 2	Plan and action	<ul style="list-style-type: none"> <li>Utilising data elicited from Case Study 1, a usual class activity, Case Study 2 was given to the learners.</li> </ul>
	Data collection	<p>On completion of Case Study 2</p> <ul style="list-style-type: none"> <li>Data collected by examining the product created in Case Study 2.</li> <li>Learners observed.</li> <li>Event log kept.</li> </ul>
	Analysis and reflection	<ul style="list-style-type: none"> <li>Data collected in Case Study 2 analysed on the basis of the profile developed in the literature study.</li> </ul>
	Data redefinition	<ul style="list-style-type: none"> <li>Two case studies synthesised and activities revealed how South African learners interact with information from cognitive, affective and physical perspectives.</li> </ul>

### 3.1 Preliminary stage

Recognition of a problem, conducting a literature review and the development of a profile were the preliminary steps in finding the focus of this research. By the end of this stage the main problem and research questions were defined. The next task was how to test if the profile based on the literature was any different from that of a learner in an educational digital environment of a South African FET institution.

#### 3.1.1 Definition of problem

The researcher recognised a problem at PHS in the computer laboratory while teaching Computer Studies SG and wondered if the same problem occurred in other South African educational institutions in the digital environments of their computer laboratories. The learners were observed and significant behaviours noted. Books, journals and the Internet was browsed to find a focus to the problem.

#### 3.1.2 Literature review

The Nexus database was consulted in an endeavour to shed light on the problem but to no avail. Books by Rushkoff (1999) and then Tapscott (1999a) were the triggers that focused the search for a solution. A literature search on the topics below in books, journals and digital resources lead to the decision to investigate how South African FET learners interact with information from cognitive, affective and physical perspectives in a digital environment:

- Digital literacy, electronic literacy, information literacy, literacy.
- *00 Generation, Children of Chaos, Digital Age, Generation X, Generation Y, Information Age, Millennial Generation, Net Generation, Nintendo Generation, Oh-Oh teens, Technological Age.*
- Computer anxiety, technological anxiety, technophobia.
- Information, information acquisition, information overload, information processing, learning.
- Hypermedia, hypertext, interactivity, multimedia, virtual environment.

The literature review developed into the research problem for this investigation, viz.: 'How do South African FET learners acquire, recall, process and present information in a digitally enabled environment?' with the research questions:

- What is an educational digital environment?

- How has a changing society and technology influenced the way South African FET learners interact with information in an educational environment?
- What is meant by cognitive, affective and physical perspectives with reference to interaction with information?

1. How do South African FET learners interact with information in a digital environment from cognitive, affective and physical perspectives?

### 3.1.3 Profile development

In order to describe how the South African FET learners in an educational digital environment interact with information from cognitive, affective and physical perspectives, a profile was developed to be compared with that of learners in the digital environment of the computer laboratory at PHS. The literature search and review, Chapter 2, helped refine and define the profile into perspectives, and each perspective was further divided to see how they were manifested in the learners' information processing as manifested in Table 3 - 3.

**Table 3 - 3 Perspectives and processes used in the analysis**

Perspective	Process
Cognitive	Acquiring information
	Recalling information
	Processing and planning information
	Presenting information
Affective	Motivation
	Influence of peers
	Managing time
	Mental state
Physical	Acquiring information
	Recalling information
	Processing and planning information
	Presenting information

The process of how learners interact with information is tabulated in Table 3 - 3 based on the perspective. The aim was to investigate how learners acquired, recalled, processed and planned and presented information from a cognitive perspective; how they were motivated, influenced by peers, managed time and their mental state from an affective perspective; and how they acquired, recalled, processed and planned and presented information from a physical perspective.

## 3.2 Cycle 1

The research in Cycle 1, Chapter 5, had the dual purpose of trying to find out how the learners interacted with information when they created a web entry for a competition, and finding a better way of managing or giving a project to learners. The project was given to the learners in September (Grade 11D) and January (Grade 10D) as part of their usual class work, with no thought of data collection or this research project. As the data from the literature review was analysed and reviewed, the research plan developed and the method of collecting data via the questionnaire was planned. The analysis of the data from the questionnaire and the web site product analysis led to a clearer idea of how learners interacted with information.

### 3.2.1 Plan and action

Against the background of all the work done by the six FET Grades 10 to 12 classes at PHS taught in the digital environment of the computer laboratory, a project was selected as being representative of usual work. This project, Appendix E, was used as Case Study 1 as a means to collect data from two classes. Case Study 1 was the creation of a web site for a *ThinkQuest* competition.

### 3.2.2 Data collection

The *ThinkQuest* web design competition project was given to Grades 10D and 11D with one grade being new to web-authoring and the other relatively experienced. The following discussion will report on the research methodology used to collect and analyse the data in Case Study 1. The perspective and processes used in the analysis, Table 3 - 3, were suggested by the literature review. These perspectives and processes were kept in mind in the development of the questionnaire, Appendix I, which helped analyse the process of creating the *ThinkQuest* entry and contributed to the body of information on how the learners interacted with information in the digital environment. The questionnaire elicited data mainly of cognitive, affective and physical processes. The products of the project, the *ThinkQuest* web entries, mainly elicited data of a cognitive nature.

#### 3.2.2.1 Data collection of the process - Questionnaire

The questionnaire, Appendix I, used to collect data, was given to the two classes, Grades 10D and Grade 11D who created the *ThinkQuest* competition entries, and



Grade 11A who created the Red Cross Hospital Primary School activity book although only the questionnaire of those learners who completed the *ThinkQuest* entry were analysed. Details about the questionnaire, the questions and the manner in which the data was collected, are tabulated in Table 3 - 4.

**Table 3 - 4 Use of the project questionnaire**

Unit	Detail
Questionnaire	<ul style="list-style-type: none"> <li>• The learners completed the questionnaire in class time in secrecy.</li> <li>• There was no limit on the time used to complete it.</li> <li>• The aim of the questionnaire was to gather data on how the learners created their Red Cross activity book and <i>ThinkQuest</i> competition entry projects.</li> </ul>
Questions	<ul style="list-style-type: none"> <li>• The questions were open-ended in the hope that the learners would feel free to discuss the topic without restriction.</li> <li>• The questions were based on topics brought out in the literature review and through observation.</li> </ul>
Data	<ul style="list-style-type: none"> <li>• Only the data from the questionnaires of those learners who entered the <i>ThinkQuest</i> competition was used.</li> <li>• Unclear data was made clear with the supporting questions, and those of the partners.</li> <li>• Interviews were conducted to clarify very few details.</li> <li>• Some of the data was not directly used in any chart or table in Chapter 5 - Case Study 1, but all the data helped create a profile of how the learners interacted with information in the digital environment while creating their project.</li> <li>• Data collected in the questionnaire was analysed and used as a basis for the way in which the next project, the PowerPoint tutorial with Visual Basic for Applications (VBA) on computer networks, Appendix G, was given to Grade 11. The success of the PowerPoint presentation led to the web-based CV, Case Study 2.</li> </ul>

The questionnaire is examined in the following section noting the perspectives and domain it aimed to illuminate. The responses from a few questions were not used as the answers were not clear. The results of the analysis are discussed in Chapter 5 under the perspective and processing headings.

### 3.2.2.1.1 Cognitive perspective

I looked for information of how the learners worked with information from a cognitive perspective. These are the things I focused on:

- Where the learners recalled the web-authoring skills
- Where they found the information for their web entries

### 3.2.2.1.2 Affective perspective

One of the aims of the questionnaire was to elicit information on how the learners worked with each other and information. Many of the questions were focused on motivation, the influence of peers, the management of time and the learners' mental state. I looked for information on the following matters.

The questions on motivation focused on:

- Why they put so much or so little effort into their project
- What their parents / guardians thought of the project
- How they felt when strangers looked at the project

The questions on the influence of peers focused on working with partners in a group from the point of view of:

- Selection of partners
- Working with partners
- Managing conflict in the group
- Allocating marks to a partner
- Learning from others

The questions on the management of time focused on:

- Whether the learners had sufficient time for the project
- When they started the project
- When they did most of their work
- Whether they project planned their work

The questions on the learners' mental state focused on:

- What the learners were most proud of
- How they coped with technical problems

### 3.2.2.1.3 Physical perspective

The questions relating to the physical creation of the web entries focused on the processing and planning of the entry:

- Where and why they worked in a particular place

### 3.2.2.2 Data collection of the product - *ThinkQuest* web entries

Data about the web site was collected by examining each site individually and looking for certain features. The results of the examination were entered into a spreadsheet for statistical analysis, Appendix K. All 25 entries, with the exception of one totally incomplete and one not saved for research purposes, were analysed and certain features were counted and noted.

The following features that I looked for were assumed to be indicators of cognitive manifestations of the processing, planning, structuring and amount of information:

- Amount of information
- Clear structure
- Frames
- Image map
- Levels of information
- Shared borders

The following features that I looked for were assumed to be indicators of cognitive manifestations of presenting information:

- Animated gif made with *CoffeeCup Firestarter* or *Flash*
- Animated gif made with *Gif Animator* or similar
- Animated gif, clipart
- Background image
- Crossword puzzle
- Drop down box
- Feedback form
- Guest book
- Jigsaw puzzle
- Mouse over
- Picture, not interactive
- Quiz
- Sound clip
- Spelling mistake
- Thumbnail
- Tile puzzle
- Video clip

### 3.2.3 Analysis and reflection

The data collected about the *ThinkQuest* web entry was analysed and presented as percentages in charts and tables in Chapter 5, comparing the two classes where possible. The profile developed in the literature review, Chapter 2, assisted in the analysis. The collected data indicated that there was something 'missing' in the way the site was created. The learners were not aware of anything 'wrong' but in general they were not good web sites as they were not interactive but merely presented information.

### 3.2.4 Data defined

After the analysis, usual class activities continued. When Grade 11 learners created a PowerPoint tutorial with VBA on networks in class, Appendix G, the 'missing' something became clearer. Plans were put in action to give the learners a web task that would result in a better web with more learners completing the task.

The information collected in the questionnaire and in the product of the web had made it clearer how learners worked in a digital environment and what was required in the teaching process to make a wonderful interactive web site. The data is tabulated in Section 5.4, *Conclusion of the analysis*, in Chapter 5.

## 3.3 Cycle 2

The analysis of the process and product of the web-based curricula vitae were based on observation and analysis of the learners' web-based CVs, reported in Chapter 6. The plan of how to do the work was based on reflections after Case Study 1 and the PowerPoint tutorial. Data was collected by examining the product of the CV and analysed.

### 3.3.1 Plan and action

During Case Study 1 data was collected and analysed. After reflection and further usual class activities in the digital environment of the computer laboratory, the learners took part in another project, the PowerPoint tutorial on networks, Appendix G. During the PowerPoint work the profile was again redefined and on that basis the next iteration, a web-based CV project, Appendix H, was given to the learners. This project was meant to be representative of usual work in a digital

environment. The two groups who undertook this project were one class that had taken part in Case Study 1, and a new class. This was part of Case Study 2.

### 3.3.2 Data collection of the process and product - Web-based CV

Grade 11A and 11D created web-based CVs in Case Study 2, note the differences in the classes in Table 3 - 5. The following will report on the research methodology used to collect and analyse the data in Case Study 2.

Once the web-based CV was complete, data about the web site was collected. Each site was examined individually while looking for certain features. The results of the examination were entered into a spreadsheet for statistical analysis, Appendix L. The learners were observed working on their CV in the class environment and behaviour was noted in an event log.

The following features that I looked for with both affective and physical perspectives were assumed to be indicators of the influence of peers while processing information:

- Animated gif made with *CoffeeCup Firestarter* or *Flash*
- Animated gif made with *Gif Animator* or similar
- Animated gif, clipart
- Crossword puzzle
- Frames
- Mouse over
- Quiz
- Thumbnail

### 3.3.3 Analysis and reflection

The analysis of the web-based CV was done in the same way as the *ThinkQuest* web entry in Cycle 1. The work is presented mostly in charts and tables as percentages comparing the two classes. When the features were entered onto a chart showing the seating positions of the learners in the class, then processes in the affective domain were noted. One was able to see who sits next to whom and what influence they probably had on each other. Having observed these learners over a course of two full years, and analysing the data collected via the analysis of

the web-based CV product as well as looking at cognitive and affective processes, a new profile was developed and defined.

### 3.3.4 Summary of the research plan

To summarise and conclude the research plan:

- A problem was observed in the digital environment of the computer laboratory while teaching South African FET learners at PHS.
- The Literature Review was based on the problem observed in the class.
- A profile was developed based on the Literature Review.
- Data was collected in Cycle 1 - Case Study 1 and developed into a profile that was compared with that of the Literature Review.
- Information obtained from Cycle 1 - Case Study 1 was used as a basis for the work in Cycle 2 - Case Study 2.
- Data was collected in Cycle 2 - Case Study 2 and developed into a profile that was compared with that of the Literature Review.
- Information obtained in Case Study 1 was synthesised with that of Case Study 2 to create a new profile of how South African FET learners in a digital environment interact with information from cognitive, affective and physical perspectives while *successfully* acquiring, recalling, processing and presenting information.

## 4 Measures to ensure validity and reliability

There are multiple views of reality (Merriam, 1998, p. 212) and according to Derrida, many 'things ... do not have definable meaning' (Caputo, 1997, p. 31). The following discussion will show the attempts made to produce valid, authentic and reliable meaning and knowledge about how South African FET learners at PHS work in a digital environment, which is then compared with the literature to create a profile on how South African FET learners interact with information in a digital environment from cognitive, affective and physical perspectives.

### 4.1 Internal validity

In research, internal validity is concerned with how the research findings match reality (Merriam, 1998, p. 211). The strategies used in this thesis to defend internal validity are triangulation, member checks, long-term observation, peer examination, expert review, participatory mode of research and taking note of researcher's bias

are those from Merriam (1998, p. 204). The goal of these strategies were to produce valid and authentic findings.

#### 4.1.1 Triangulation

The project used multiple ways of looking at how the learners interacted with information in the digital environment. In the case studies tabulated in Table 3 - 5, different groups were used in different grades, with different academic abilities, with different prior teaching, at a distance and in contact situations. The case studies themselves were representative of usual work done in an educational digital environment. It is believed that the case studies will provide a holistic understanding of how the FET learners at PHS interact with information in a digital environment.

In Table 3 - 5 the ✓ symbol indicated that there were similarities between the two groups. The X symbol indicated that there were differences between the two groups.

**Table 3 - 5 Similarities and differences in the three groups who created web sites for the two case studies**

Case Study	Grade 10D 26 learners		Grade 11D 30 / 29 learners		Grade 11A 30 learners
Case Study 1	Academically strong	✓	Academically strong		
	Had one week introduction of web-authoring lessons	X	Had one term instruction of web-authoring lessons		
	At a distance	✓	At a distance		
Case Study 2			Academically strong	X	Academically challenged
			Had one term instruction of web-authoring lessons	✓	Had one term instruction of web-authoring lessons
			Web-authoring experience, i.e. <i>ThinkQuest</i>	X	No formal web-authoring experience
			Contact	✓	Contact

#### 4.1.2 Member checks

The members or subjects of the research regularly checked the research as it was written up. Discussions often took place with the learners on the best way to teach in a computer laboratory. They wanted their time spent in class to be beneficial so

that they could obtain high marks as a result of effective teaching. They questioned the results of the analysis of Case Study 1, but they did agree that the analysis was correct. They were not really interested in the analysis of Case Study 2 as their work and their marks were already so good. I have to interpret their lack of interest in that, once success had been achieved in the digital environment of the computer laboratory, that was the end of their concern.

#### **4.1.3 Long-term observation**

The learners at PHS in the digital environment of the computer laboratory have been observed since 1997. During this time they all did similar work and the problems were noted. The main research project of Cycles 1 and 2 was conducted over a period in 2001. The writing up of the case studies in Chapters 5 and 6 was completed during 2001 and 2002. The participants in the case study regularly checked the writing as it took place during 2001 and 2002.

#### **4.1.4 Informal peer review**

The profile developed during the literature review were presented at the 'Africa Connects Conference' (Africa, 2001). The audience concurred with the profile as it was then and added many new physical manifestations of how learners interact with information in a digital environment. Colleagues have read the research as it has developed offering few comments, apart from those of Neil Eddy in Case Study 2.

#### **4.1.5 Informal expert review**

The informal reviews of a number of people have contributed to the validity of the findings. Their observations were followed up with interviews via telephone and email.

- My supervisor spent a day in the computer laboratory interacting with my learners and has reviewed and commented on the work as it has progressed, based on knowledge of the learners and the environment.
- Annette de Jager, a fellow doctoral student in the field of computer-assisted education, spent time observing the learners in the computer laboratory and has reviewed the findings offering comments as it progressed.
- Fellow doctoral student in the field of computer-assisted education, Jean Slabbert, critically reviewed the findings on the basis of knowledge of happenings



in the computer laboratory and expert knowledge of the field of computers and education.

#### **4.1.6 Participatory mode of research**

The learners did not seem to mind being involved in the research about how they worked in the computer laboratory in the subject Computer Studies SG. They knew the work had to be done while the applications and theory were learned and taught. They knew that their school and computer department were well known for being successful. They wanted good marks. They trusted me. They knew that working in a computer laboratory or digital environment was new. They accepted that research had to take place to find the optimum way of working in such an environment. At PHS the learners often complete questionnaires as part of Total Quality Management. They participated in the research with enthusiasm.

The data collected from the learners was part of the usual work of the class. They completed the questionnaire in Cycle 1 - Case Study 1 as a means of evaluating the work of their partners and the process of creating the web site. The product of the web entry was examined and data was collected for grading purposes which is a usual event. The data collected from the product of the web-based CV was also examined and data collected for grading purposes, a usual event.

#### **4.1.7 Researcher's bias**

I have a bias. I want to understand the dynamics between the digital information environment and the learners in my computer laboratory in order that work done there can be successful. I have a personal interest in the research. As I spend all day, every teaching day of the year, in a digital environment, I want to find out how learners work with information in this environment, in order to make my work easier and more successful.

As the teacher and researcher I was very involved. My role has been made obvious and clear throughout this report. I may be seeing things that are not there but I checked my vision by using member checks, peer examination, expert review, participatory mode of research just discussed and being aware of my own bias.

## 4.2 External validity

For the purposes of this qualitative research, external validity means that there is a detailed enough description of the context of the research for the reader to compare it with other situations. The goal is to show the rich diversity in order to illustrate the commonalities. To enhance the ability of a reader to make the results of this qualitative research applicably generalisable to other situations, the following strategies from Merriam (1998, p. 211) were used: a rich, thick description and a multisite design.

### 4.2.1 Rich, thick description

The work of the learners in the digital environment is described showing the complexities and dynamic nature of the interaction with information, in the context of the school. Chapter 4 describes the research site as fully as possible by

- discussing the school in general terms and the language, gender, race or culture distributions as well those who commute to school;
- examining the digital architecture of the school and the digital environment or computer laboratory in which the research is done;
- studying the approximately 180 participants in the research per grade with respect gender, race or culture distributions and familiarity with a digital environment;
- describing the type of work done in the digital environment or computer laboratory as well as discussing certain projects per grade; and
- comparing two individual case studies with respect to management of the project.

### 4.2.2 Multisite design

This research looks at how a group of 180 learners interact with information in a digital environment and uses two case studies to gain data. These case studies look, in particular, at three different groups doing similar work at different stages with different requisites, see Table 3 - 5, as part of usual class activities.

## 4.3 Reliability

In order to ensure that the data recording, data analysis and interpretation of the analysis are reliable, consistent and dependable, the following methodologies from McMillan and Schumacher (1993. p. 386) were applied. It is believed that the data

is reliable in the context of the PHS computer laboratory digital environment in 2001. Every aspect of the data recording, collection, analysis and interpretation is done as far as possible with socially responsible actions.

#### **4.3.1 Data recording**

The data was collected in written format so that, should it be misinterpreted, it could be checked. The learners checked my interpretation of the data.

#### **4.3.2 Data analysis**

The method of analysing the data is described in the study to facilitate the checking and methodology. Peers checked the data analysis.

#### **4.3.3 Interpretation of the data**

The participants in the research, the learners, checked the interpretation of the research.

## **5 Ethics**

The purpose of the study is to describe how South African FET learners interact with information in a digital environment. There was no clash of ethics in the data collection or the research project.

### **5.1 Protection of identities**

Pseudonyms have been used to keep the identities of the learners anonymous. The participants in the research took part in the research as it took place. In Case Study 1 no names of learners are attributed to the quotations, only their gender and grade. In Case Study 2 names are used to identify learners. Although the learners' real names were used when they checked the Case Study 2 report, the names have been changed in keeping with their gender and cultural background. Girl's names have been replaced with other girl's names and boy's names have been replaced with boy's names. Those from an Afrikaans, English, Moslem, Sotho, Russian or Xhosa background have had their names replaced with others from the same cultural background respectively in order to protect their identities but still maintain their cultural identity. All the names selected were five letters long or less.

## 5.2 Consent

This thesis *reported* on how the participants interacted with information in their regular classroom practice hence it could not have been harmful in any way as they were not subject to any treatment. I had informal consent of the participants and their parents. I had official sanction of my headmaster, Dave Arguile, to do research in the school.

## 6 Summary

This chapter has described the research methodology that was followed, the action research process and a case study methodology, the stages of the research and the methods taken to ensure validity and reliability. Measures taken to preserve the anonymity of the learners were described as well as the ethical nature of the research.