

# **WEB-BASED INSTRUCTION AT A HIGH SCHOOL**

by

**Moeketsi Jonas Sesemane**

**MINI-DISSERTATION**

submitted in partial fulfilment of the requirements for the degree

**MAGISTER EDUCATIONIS**



**FACULTY OF EDUCATION AND NURSING**

at the

**RAND AFRIKAANS UNIVERSITY**

**Supervisor: Dr D van der Westhuizen**

**NOVEMBER 2000**

## **ACKNOWLEDGEMENTS**

**I wish to convey my sincere gratitude and appreciation to the following people:**

- ❖ Dr D van der Westhuizen, my supervisor, for his time, guidance and perceptive comments throughout the course. I benefited greatly from his guidance and insight.**
- ❖ Ms C L'Ange for external coding of data.**
- ❖ Mrs B Wade for transcribing the interviews.**
- ❖ Johan and Ansie Brink of COD Typing for editing this dissertation**
- ❖ Mr D van Rensburg, the principal of St. Conrad's College for granting permission for conducting the case study.**
- ❖ Ms S van Zyl, the computer centre instructor and Grade 7H & 8C learners for their enthusiastic participation in the 'virtual' classroom and necessary arrangements leading to the interviews.**
- ❖ Mrs R Mphahlele and Ms I Bekker for the assistance and encouragement throughout this study.**
- ❖ Finally, to my wife Vanessa, and my children, Katleho and Koketso. Thank you for your sacrifices, support and understanding.**

# TABLE OF CONTENTS

List of tables .....	vii
List of figures .....	viii
Synopsis .....	ix
	<b>Page</b>
<b>CHAPTER 1</b>	<b>1</b>
<b>GENERAL ORIENTATION</b>	
<b>1.1 INTRODUCTION</b>	<b>1</b>
<b>1.2 RATIONALE OF THE STUDY</b>	<b>2</b>
<b>1.3 RESEARCH QUESTION</b>	<b>4</b>
<b>1.4 THE AIM OF THE STUDY</b>	<b>5</b>
<b>1.5 THE RESEARCH DESIGN</b>	<b>6</b>
1.5.1 CASE STUDY	6
1.5.2 THE PARTICIPANTS	6
1.5.3 DATA COLLECTION METHODS	6
1.5.4 MEASURES TO ENSURE TRUSTWORTHINESS	7
<b>1.6 THE RESEARCH PROGRAMME</b>	<b>7</b>
<b>1.7 SUMMARY</b>	<b>8</b>

<b>CHAPTER 2</b>	<b>9</b>
<b>LITERATURE REVIEW</b>	
<b>2.1 INTRODUCTION</b>	<b>9</b>
<b>2.2 WBI: A THEORETICAL PERSPECTIVE</b>	<b>9</b>
2.2.1 A DEFINITION OF WEB-BASED INSTRUCTION	9
2.2.2 WEB-BASED LEARNING ENVIRONMENTS	11
2.2.3 LEARNING ADVANTAGES AND LIMITATIONS OF WEB-BASED INSTRUCTION	12
2.2.3.1 Advantages of Web-based material	12
2.2.3.2 Limitations of Web-based instruction	13
2.2.4 FEATURES OF WEB-BASED INSTRUCTION LEARNING ENVIRONMENTS	15
<b>2.3 PEDAGOGICAL PERSPECTIVE</b>	<b>17</b>
2.3.1 LEARNER ACCEPTANCE OF PARTICIPATION IN A VIRTUAL CLASSROOM	17
2.3.2 WEB-BASED INSTRUCTION AND COGNITIVE LEARNING OBJECTIVES	19
2.3.3 WBI AND LEARNING STYLES	20
2.3.4 INSTRUCTIONAL PRINCIPLES FOR WBI	21
2.3.5 INTERACTION IN THE WBI ENVIRONMENT	22
2.3.5.1 Interactive learning on the World Wide Web	22
2.3.5.2 Types of interaction	23
<b>2.4 DEFINITION OF SECURENESS IN THE WBI CONTEXT AT INTERMEDIATE PHASE</b>	<b>24</b>
<b>2.5 SUMMARY</b>	<b>25</b>

<b>CHAPTER 3</b>		<b>26</b>
<b>DESIGN AND IMPLEMENTATION OF THE VIRTUAL CLASSROOM</b>		
<b>3.1</b>	<b>INTRODUCTION</b>	<b>26</b>
<b>3.2</b>	<b>THE CONTEXT OF IMPLEMENTATION OF A VIRTUAL CLASSROOM</b>	<b>26</b>
3.2.1	THE SCHOOL	27
3.2.2	THE SUBJECT	27
3.2.3	THE PARTICIPANTS	27
3.2.4	THE AIM	28
<b>3.3</b>	<b>THE DESIGN AND DEVELOPMENT OF THE VIRTUAL CLASSROOM</b>	<b>28</b>
3.3.1	DEVELOPMENT APPROACH	29
3.3.2	DESIGN CONSIDERATIONS	30
3.3.3	ORGANISATION AND PRESENTATION OF MATERIAL	31
3.3.4	NAVIGATION IN THE VIRTUAL CLASSROOM	32
<b>3.4</b>	<b>DESCRIBING THE VIRTUAL CLASSROOM</b>	<b>32</b>
3.4.1	THE VIRTUAL CLASSROOM COMPOSITION	33
3.4.1.1	Grade 7H information	33
3.4.1.2	Calendar	33
3.4.1.3	Links	33
3.4.1.4	Communication forum	34
3.4.1.5	Tasks	34
<b>3.5</b>	<b>IMPLEMENTATION OF THE VIRTUAL CLASSROOM</b>	<b>36</b>
<b>3.6</b>	<b>SUMMARY</b>	<b>36</b>

<b>CHAPTER 4</b>	<b>RESEARCH DESIGN OF THE STUDY</b>	<b>38</b>
<b>4.1</b>	<b>INTRODUCTION</b>	<b>38</b>
<b>4.2</b>	<b>PURPOSE OF RESEARCH</b>	<b>38</b>
<b>4.3</b>	<b>RESEARCH DESIGN</b>	<b>38</b>
<b>4.4</b>	<b>RESEARCH METHOD</b>	<b>42</b>
<b>4.5</b>	<b>DATA COLLECTION TECHNIQUES USED IN THIS STUDY</b>	<b>43</b>
4.5.1	OBSERVATION	43
4.5.2	FOCUS GROUP INTERVIEW	44
4.5.3	INTERVIEWS	44
4.5.4	QUESTIONNAIRES	45
<b>4.6</b>	<b>DATA ANALYSIS</b>	<b>46</b>
<b>4.7</b>	<b>THE TRUSTWORTHINESS OF THE RESEARCH</b>	<b>47</b>
4.7.1	THE STRATEGY OF CREDIBILITY	48
4.7.2	THE STRATEGY OF TRANSFERABILITY	48
4.7.3	THE STRATEGY OF CONFIRMABILITY	49
4.7.4	THE STRATEGY OF DEPENDABILITY	49
<b>4.8</b>	<b>SUMMARY</b>	<b>50</b>

<b>CHAPTER 5</b>		<b>51</b>
<b>RESEARCH FINDINGS AND RESULTS: LEARNER AND TEACHER EXPERIENCE OF THE VIRTUAL CLASSROOM</b>		
<b>5.1</b>	<b>INTRODUCTION</b>	<b>51</b>
<b>5.2</b>	<b>LEARNER EXPECTATIONS AND PERCEPTIONS</b>	<b>51</b>
5.2.1	LEARNER EXPECTATIONS WERE REALISED	51
5.2.2	LEARNERS HAD BOTH POSITIVE AND NEGATIVE PERCEPTIONS OF INTERACTION	52
5.2.3	LEARNERS WERE GENERALLY POSITIVE ABOUT THEIR EXPERIENCES	53
5.2.4	LEARNERS HAD VARIED EXPERIENCE OF SECURENESS IN THE VIRTUAL CLASSROOM	54
5.2.4.1	Dependency on instructor	54
5.2.4.2	Co-operative groups	55
5.2.5	LEARNERS PREFERRED THE VIRTUAL CLASSROOM TO CONVENTIONAL TEACHING	56
5.2.5.1	Learners enjoyed visual information	56
5.2.5.2	The use of available information for learning purposes	57
5.2.5.3	Advantages of Web-supported learning	57
<b>5.3</b>	<b>LEARNERS IMPROVED THEIR SKILLS</b>	<b>58</b>
<b>5.4</b>	<b>TEACHER EXPERIENCE OF THE VIRTUAL CLASSROOM</b>	<b>59</b>
5.3.1	TEACHER EXPERIENCE OF THE STRENGTHS OF THE VIRTUAL CLASSROOM	60
5.3.2	TEACHER EXPERIENCE OF THE WEAKNESSES OF THE VIRTUAL CLASSROOM	61
<b>5.4</b>	<b>SUMMARY</b>	<b>61</b>

<b>CHAPTER 6</b>	<b>63</b>
<b>OVERVIEW OF THE STUDY, CONCLUSION, DEFICIENCIES AND RECOMMENDATIONS FOR FURTHER RESEARCH</b>	
<b>6.1 OVERVIEW</b>	<b>63</b>
<b>6.2 CONCLUSION</b>	<b>63</b>
<b>6.3 LIMITATIONS OF THE STUDY</b>	<b>66</b>
<b>6.4 RECOMMENDATIONS FOR FURTHER RESEARCH</b>	<b>66</b>
<b>6.5 FINAL WORD</b>	<b>67</b>
<b>LIST OF SOURCES</b>	<b>69</b>
<b>APPENDICES</b>	<b>74</b>



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## LIST OF TABLES

		<b>Page</b>
Table 1.1	Previous research (Nexus Search database)	4
Table 2.1	Traditional instruction vs. Web-based instruction	12
Table 2.2	Features and components associated with WBI learning environments	16
Table 2.3	Hypertext and Bloom's taxonomy of the cognitive domain	19
Table 3.1	An overview of the characteristics of the learners of grade 7H	28
Table 5.1	Learners' e-mail skill performance	54



## LIST OF FIGURES

	<b>Page</b>
Figure 3.1 The homepage of the virtual classroom	35
Figure 4.1 Diagram illustrating the research design of the study	41



## SYNOPSIS

The aim of this study is to investigate the feasibility of using Web-based Instruction at high schools, being a new approach and method of learning interaction that employs hypermedia. The investigation was important because the use of Web-based Instruction in high schools, especially in South Africa, is not yet recorded or reported.

The perceptions, opinions and experiences of both learners and the instructors were monitored through observations and interviews. To realise the effectiveness of useful interaction by virtual classroom in enhancing Web-based learning, this study incorporates a qualitative analysis of data.

The results of this study indicate that learners were enthusiastic and motivated to participate. The project lesson reinforced positive feelings about learning via the Web.

Finally, Web-based Instruction can be a successful educational approach for high schools, provided that thorough planning and preparations are done before implementation, by ensuring that learners have access to stable and reliable Internet Service Provider. Meanwhile, e-mail interaction between the learners and the instructor, and among the learners, can be invaluable enhancement to Web-based learning.

## CHAPTER 1

# GENERAL ORIENTATION

### 1.1 INTRODUCTION

It is evident that new paradigms for education are evident in the education system in South Africa, as new methods, approaches and techniques are designed and implemented, based on the educational needs of the society. Khan (1998:67), asserts that as the information age evolves, society is undergoing massive changes that have tremendous impact on the educational systems. Furthermore, advances in information technology, coupled with changes in society, are creating new paradigms for education. According to Khan (1998:67), participants in this new educational paradigm require rich learning environments, supported by well-designed resources.

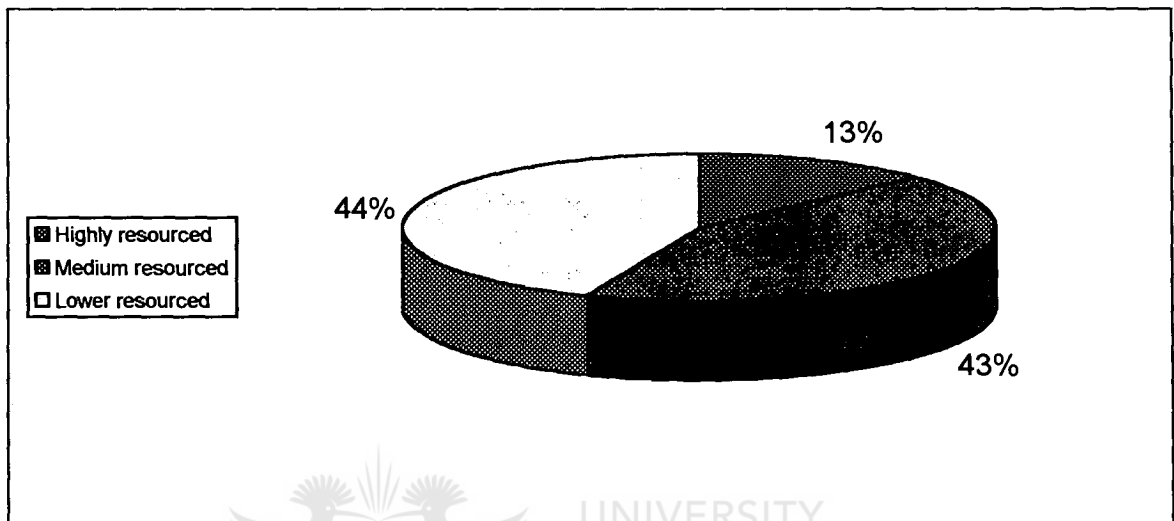
Websites are gaining popularity as classroom resources at secondary schools. Their effectiveness in assisting learners to reach educational objectives has yet, however, to be well documented in South Africa.

This study is designed to assess the experiences of grade 7 learners about the use, utility and effectiveness of literary websites in web-supported lessons at St. Conrad's College. The experiences of the learners who participated in the web-supported lesson will indicate that the lesson-presentation enabled them to interact with the web in the context of a search for content or reading task.

In this chapter, the researcher will investigate the experience of learners and the teacher in the virtual classroom at intermediate phase. In the South African context, the use of *Web-Based Instruction* (WBI) is gaining popularity in institutions of higher learning. However, only highly resourced schools can

can afford the equipment. The illustration below shows the situation of computer usage in South African schools (O'Connor, 2000:2).

**Figure 1.1 The computer usage in schools in South Africa**  
**Percentages indicate schools' affordability in regard to resources.**



## 1.2 RATIONALE OF THE STUDY

In the South African context, WBI is more popular at universities for online education and telematic teaching. Online education and telematic teaching are more suitable for part-time students and those who cannot afford to be on campus on a daily basis. The use of WBI in secondary schools, especially in South Africa, is not yet recorded or reported.

The rationale for the study is:

- to investigate how the learners at the intermediate phase use the Web to support their learning;
- to determine how the virtual classroom can be an alternative to face-to-face teaching;

- to determine whether learners will be secure on their own in front of the computers, without the presence of a knowledgeable person at their side;
- to assess the technological skills, attitude and the secureness of the learners in a virtual classroom generally, and
- a review of the Nexus Search's Database conducted in April 2000, no study investigated the use of WBI in South African secondary schools.

**Table 1.1** below lists only 10 related studies both completed and incomplete in South Africa related to online education.

Researcher(s)	Topic	Year	Level
Bothma TJD	The use of hypermedia in a didactic information system for biblical languages and culture	1995	Non-qualification
Brown S & Thomas T	A framework for the facilitation of co-operative learning in an online classroom in South Africa	1998	M Tech
Choonoo P	<b>Online instruction: An experiment to investigate the effectiveness of concept-based and procedural teaching methodologies in providing instruction in the use of the URICA opac system at ML Sultan Technikon</b>	1998	D Tech
Choonoo P	A comparative study of the effectiveness of the application of concept-based and procedural <b>teaching methods</b> in user instruction of <b>online public access catalogues (OPACS)</b>	Incomplete 1997	PhD
Clarke PA	Telematic teaching of adults via the World Wide Web: A University case study.	1998	M ED

Researcher(s)	Topic	Year	Level
Fourie I	Design of a multimedia study package for distance teaching of computerised information retrieval	1992	D Lit. et Phil
Fourie S	Principles of effective interface design for CBT: A literature review	1993	M Ed
Nortje E	Hypermedia and multimedia in education: trends toward a future solution	1997	M Dip Tech
Van Brakel PA	Training in online searching in a LAN environment	Unknown	Non-qualification
Van der Westhuizen D	Teaching Information Technology in Education using online education	1999	D Ed

**Table 1.1 Previous research (Nexus Search Database)**

From the table it is evident that this study is a relatively new study in South Africa, as it aims at investigating learning experience of the learners attempting to learn and teacher experience attempting to teach, via the web.

The St. Conrad's College has implemented the *Futurekids Technology Curriculum* at foundation and intermediate phase, and Applied Technology is taught to enhance learning in classes. The facilitator in the computer laboratory was not sure if WBI could be used to support teaching and learning, as the learners were to miss the face-to-face teaching situation during computer classes.

The research question is formulated from the above-mentioned context.

### 1.3 RESEARCH QUESTION

The main research question ***“How did grade seven learners at St. Conrads’ College experience Web-based Instruction during a first encounter?”*** is investigated by this study.

Specifically, the following sub-questions are to be answered in order to answer the research question:

- What is Web-based Instruction?
- What are the pedagogical dimensions of Web-based Instruction?
- How did the learner experience interaction while learning via the web?
- How does the learner experience secureness in Web-supported learning at Intermediate phase?
- How do learners compare this teaching approach with conventional teaching?
- How could Web-based Instruction be implemented in similar situations?

### 1.4 THE AIM OF THE STUDY

The study aims at recording and reporting the experiences of learners and the teacher who attempted to learn and teach, respectively, via the web at St. Conrad’s College. In order to achieve the aforementioned aim, the objectives are mentioned as follows:

- To define and describe Web-based instruction in the context of this study;
- To describe learners experience of secureness during the presentation of the course;
- To design and implement a Web-based Instruction lesson based on the pedagogical dimensions of WBI;



- To determine whether learners experience meaningful interaction while learning via the web; and
- To provide recommendations for further implementation in the similar situations as compared to conventional approach.

## **1.5 THE RESEARCH DESIGN**

The paragraphs to follow will briefly outline the research design of this study. In chapter four the research design is described fully.

### **1.5.1 CASE STUDY**

The design of this study is a case study as it aims at gaining a holistic idea of the intervention of a web-supported learning course on learners' learning experiences in one specific institution (McMillan & Schumacher, 1993:37). The nature of this study is explorative and descriptive as this is first time that learners learn via the web. The approach used is qualitative, and the interpretation of data is descriptive.

### **1.5.2 THE PARTICIPANTS**

The participants of this research are grade 7H learners and a teacher in – Microcomputers in Education Class: Web-supported lesson at St. Conrad's College.

### **1.5.3 DATA COLLECTION METHODS**

The research findings have been triangulated to ensure validity of the research results. Furthermore, the study will employ case study techniques for data collection and analysis, i.e.:

- Focus group interviews;
- The completion of interview instruments by the learners (open-ended questions);
- Individual interviews with selected learners on specific areas, based on the learning experiences; and
- Observation – indirectly observed while working on the Internet.

#### 1.5.4 MEASURES TO ENSURE TRUSTWORTHINESS

The researcher will ensure that the measure of trustworthiness will be observed in this study by using the research strategies. Strategies and criteria to ensure trustworthiness in this study will be applied in chapter four, paragraph 4.7.

#### 1.6 THE RESEARCH PROGRAMME

The following is an outline of the research report.

Chapter 2: Provides a literature study that will review literature on learning via the web.

Chapter 3: Provides the design and implementation of a Web-supported learning course.

Chapter 4: The research design of the study.

Chapter 5: The research findings and results in this study.

Chapter 6: Summary of the findings, conclusion, and recommendations for further implementation.

## 1.7 SUMMARY

This chapter was used to create the framework for this study. It was discovered that learners are accessing the Internet on daily basis, either at computer games outlets or in their respective schools' computer laboratory. The question that remains to be answered is whether the learners access the Internet to enhance learning or not.

The rationale for the study was therefore placed within a South African context, specifically in secondary schools, where the technological infrastructure is not utilised as in institutions of higher learning.

From the above context, the research question was formulated and this in turn generated sub-questions. These sub-questions were used to formulate a set of objectives for the study. The research design was described, then followed by the research programme.

## CHAPTER 2

# LITERATURE REVIEW

### 2.1 INTRODUCTION

This chapter presents a review of literature on **WBI** as related to this study, under the following main topics:

- **A theoretical perspective** will focus on the following: a definition of WBI; traditional teaching versus Web-based instruction; the advantages of Web-based material; pitfalls of WBI, and features of WBI learning environments.
- **Pedagogical perspectives** in this study concentrate on: motivation; learning styles; Web-based materials and cognitive learning objectives; WBI instructional principles and interaction.
- A definition of **Secureness** in WBI context at intermediate phase.

### 2.2 WBI: A THEORETICAL PERSPECTIVE

Web-based Instruction is perceived differently in educational settings by various authors and writers. The views and ideas of these professionals about the use of WBI in education at various institutional levels, are discussed hereunder:

#### 2.2.1 A DEFINITION FOR WEB-BASED INSTRUCTION

Various authors perceived WBI differently as the definitions below indicate:

Web-based Instruction is a hypermedia based instructional programme, which utilises the attributes and resources of the *World Wide Web* to create a meaningful learning environment where learning is fostered and supported (Khan, 1998:63).

“According to the American Council on Education, Web-based instruction is embraced in distance learning, which is a system and a process that connects learners with distributed learning resources”. While distance learning takes a wide variety of forms, all distance learning is characterised by:

- Separation of place and/or time between the instructor and the learner, among learners and/or between learners and learning resources;
- Interaction between the learner and the instructor, among learners, and/or between learners and learning resources, conducted through one or more medium; the use of electronic media is not necessary required, as cited in (Alden, 1998:1).

Alden (1998:1) further claims that Web-based instruction is a fairly recent development that is known by a number of other labels, namely, *Online Instruction*, *Web-Based Training (WBT)*, and *Learning over the Internet/intranet*.

Other definitions of WBI by various authors include the following:

- The physical separation of teacher and learner during at least a majority of each instructional process;
- The use of educational media to unite teacher and learner and carry course content;
- Separation of teacher and learner in space and time, and
- Volitional control of learning by students rather than by the distance instructor (Palloff & Pratt, 1999:5).

- However, Rein, McCue and Slein (1997:81-82) argue that the definition of WBI is viewed more broadly as a large-scale system of interconnected hypermedia resources, accessible from any computer connected to it and which facilitates access to stored text, hypertext, graphics and sounds for viewing, reference and downloading.

The researcher agrees with most of the authors that Web-based Instruction is perceived as a hypermedia-based instructional programme or system and process, which utilises the attributes of the resources of the World Wide Web to create a meaningful learning environment, characterised by the interaction between the learner and the instructor, among the learners and/or between learners and learning resources

## 2.2.2 WEB-BASED LEARNING ENVIRONMENTS

In a survey of relevant literature on Web-based Instruction and traditional instruction, the similarities and differences of Traditional and Web-based Instruction were identified (Relan & Gillani, 1998:41). Traditional instruction describes classroom instruction as a model stretching from a teacher-centred to a learner-centred curriculum, while (Lebow, 1993) explained that WBI is the application of a repertoire of “cognitively oriented instructional strategies, implemented within a constructivist and collaborative learning environment that utilise the attributes and resources of the WWW”. Table 2.1 on the next page clearly indicates the similarities and differences between these approaches.

No.	Traditional Instruction	Web-based Instruction
1.	Space bound, learning occurs within physical boundaries	Extends the boundaries of learning; multitude of learning resources.
2.	Sources of content are textbooks, teachers and static.	Varied sources of information, content becomes dynamic
3.	Learning is not integrated with the real world easily.	Promotes experiential learning and quick integration of learning with the real world.
4.	Tends to discourage social interaction.	Designed for collaboration and interaction. Learning extends beyond one classroom to everyone connected to the Internet.
5.	The teacher determines what the learner must learn.	The learner gains control of learning. Presentation of content in a hypertext format. The cognitive advantages of hypermedia.
6.	Feedback is restricted.	Learners have a choice of content, time, resources, feedback, etc., timeously.

**Table 2.1 Traditional Instruction vs. Web-based Instruction (Adapted from: Relan and Gillani, 1998)**

## 2.2.3 LEARNING ADVANTAGES AND LIMITATIONS OF WEB-BASED INSTRUCTION

### 2.2.3.1 Advantages of Web-based Instruction

- Web publishing requires few overheads and is inexpensive;
- It is developed once and is viewable on multiple platforms connected to the Internet.
- A web page can be updated instantaneously.

- Viewers access information at any time and anywhere.
- Multimedia capability that supports multi-sensory learning preference.
- Rich resources available on-line (Wong, 1997:[online]).

A further way in which the Web may add value to existing learning scenarios is through the distribution of learning resources across international boundaries to provide access to information, ideas and perspectives from other cultures and beyond the local resources of library, instructor and textbook (Harasim, 1996:17). This implies that, by means of the Internet, learners and teachers could easily access knowledge and information from other professionals in foreign countries, to their benefit. In the case of the printed media, accessibility could take some time if ordered or having to be delivered.

When WBI is used quite simply to provide basic course content to contact learners, Web delivery of material potentially frees up course facilitators, enabling more focus on learning resources and interaction with the learners. In addition, Web materials can be updated easily and quickly on the server, allowing changes to be made available to connected learners without delay.

### 2.2.3.2 Limitations of Web-based Instruction

McCormack and Jones (1998:22) pointed out that the Web-based classroom is not a solution to every problem that the teacher might encounter in his/her class. The Web, like any medium, has a number of limitations that should be considered when the teacher decides whether or not to build a Web-based classroom. The limitations are as follows:

- **Access and resources:** It is indicated that in many places around the world, learners and teachers are struggling to gain access to electricity, let alone computers and Internet.



- **Cost:** The traditional and on-campus learners could easily have access to the Web at no charge because of on-campus computer networks. However, learners who are home-based face high costs for Internet accessibility.
- **Training:** This implies that even though the Web is widespread, many the learners still need training on how to use it. The Web, being a new learning environment with its own rules and regulations, can be very intimidating.
- **Adapting to new methods:** Both the teacher and learner with experience of traditional didactic teaching methods may have problems of adapting to a new approach.
- **The Web may not be reliable:** Roerden (1997:14) also refers to the issue of reliability problems. For some reason one will try to log onto a site and get a message indicating that one has “an invalid DNS entry or the site is busy, try again later”. She places emphasis on the printing of the most important part of a site, just in case a problem occurs.
- **Copyright, privacy, security and authentication:** The emphasis here is on the copyright laws which are inconsistent and are still grappling with the demands of long-standing media such as print, painting and music. It is therefore difficult to apply copyright laws to the fast-moving world of the Web.
- **The Web can be time consuming:** Roerden (1997:13) explains that trying to find information on the Web sometimes can feel like looking for a needle in a haystack. It takes time to learn how to narrow down one’s searches. It is therefore important that one should scout out a Web site one is planning to use in a lesson plan *before* going live.

- **No Uniform Quality:** McCormack and Jones (1998:23) argued that the reliability of the Internet and its sites can be patchy, and as a result, one cannot rely on other Websites to provide resource material for one's learners.
- **The Web is not a substitute for face-to-face contact:** The warning given here is that of being cautious of falling in the trap of gratuitous use of the Web. According Roerden (1997:14), one should consider all options to meet curricular goals before making the choice to go online.

#### 2.2.4 FEATURES OF WEB-BASED INSTRUCTION LEARNING ENVIRONMENTS

Khan (1998:5) asserts that as the Web matures, new components will be available for WBI and the existing components will improve with time. As a result, new features will be available to enrich WBI learning environments. Table 2.4 on the next page illustrates this point.

<b>Features</b>	<b>Components</b>	<b>Relationship to WBI</b>
Interactive	Internet tools, servers, hyperlinks, browsers, design, etc.	WBI learners can interact with each other, instructors and online resources.
Multimedial	Browsers, authoring programs, conferencing tools, etc.	WBI courses can be designed to address learners' learning styles, using multimedia elements, such as text, graphics, audio, video, etc.
Globally accessible	Computers, modems, Internet service provider, servers, etc.	The Web provides an easy mechanism for electronic publishing.
Online resources	World Wide Web	These resources can be up-to-the-minute and archival.
Cross-cultural interaction	World Wide Web	Learners also serve as representatives of their own cultures. Ability to explore and learn about distant cultures.
Learner-controlled	Internet tools, hyperlinks, instructional design, etc.	The Web facilitates a democratic learning environment. WBI puts the learner in control with regard to feedback, time, etc.
Non-discriminatory	E-mail, newsgroups, MUDs, listservs, etc.	It is important to note that WBI courses offered in multilingual formats will be helpful to learners.
Uniformity world-wide	World Wide Web	The open standard of the Web allows creating and posting Web documents using standardised Internet addresses.
Cost-effective	World Wide Web	WBI can be cost-effective for learners, instructors, and institutions. Travelling, parking, textbooks, etc. are minimised.

**Table 2.2 Features and components associated with WBI learning environments: (Adapted from Khan, 1998:5)**

## 2.3 PEDAGOGICAL PERSPECTIVE

Pedagogical issues refer to the educational activities that enhance or rather make it possible for teaching and learning to occur. These pedagogical activities are discussed in the following paragraphs.

### 2.3.1 LEARNER ACCEPTANCE OF PARTICIPATION IN A VIRTUAL CLASSROOM

Entry stage in this regard focuses on the situational activities, which will encourage the learner to participate willingly in the virtual classroom. The focus in this study entails the process of *virtuality*.

The transition into the new learning frontier, the virtual world, is marked by the stages of virtuality (McGonigle & Eggers, 1998:23). Initially, the learner should experience the virtual course that is most difficult. McGonigle and Eggers (1998:25) further indicated that it is not only the instructors who have to go through a series of stages during a virtual course, learners have their own five stages, being:

- ***Confused stage***

According to McGonigle and Eggers (1998:25), this stage is marked by questions like: "How does this work?" and "How can one do that?" They further explained that it is definitely confusing to the learners when they are told about virtual material available on the WWW. The learners are expected to understand the concept of how the Internet works, especially when it comes to websites and links. It was further explained that to reduce the amount of negative impact on the learners, the instructor should anticipate the needs and concerns of these inexperienced learners.

- ***Shock stage***

The shock stage normally occurs when learners try to access the course materials and, after surmounting all of the technical difficulties that they encounter, learners enter the “Shock Stage” when they realise that they have “Got in!” It is during this phase that learners become more comfortable with the technology, barring other techno-problems sending them back through this phase.

- ***Timid stage***

According to McGonigle and Egger (1998:25), this stage enables the learners to access the course or the learning materials and experience the feeling of isolation when they become aware that they don't have visual contact with other learners in the virtual course.

- ***Frustrated stage***

Glitches cause learners to quickly move to the “frustrated stage”. Simply accessing the Internet causes frustration for learners. The unavailability of the computers because of the time chosen by everyone else, when learners are attempting to access the Internet from home and not being able to get in via the modem, or getting disconnected after they have accessed the Internet. It was recommended that one of the most basic things the instructor should do to alleviate this frustration, is to alert learners to the possible problems that may occur when accessing the Internet.

- **Final stage**

At the end of the process of virtuality, the learners finally reach the “Eureka stage”. This is when everything goes smoothly, without techno-problems and learners feel that all course materials could be offered via the Internet (virtually). When learners mastered Internet/Virtual classroom skills, they enjoy learning via the Web and become eager and want to explore more.

### 2.3.2 WEB-BASED INSTRUCTION AND COGNITIVE LEARNING OBJECTIVES

Text material on the Web is in form of hypertext or linked text, and according to Ross (1993:11) adds value to learning in the following manner:

- The presentation of multiple perspectives;
- Learner control;
- Non-linear and multi-dimensional traversal of complex subject content, and
- Link-making relational associations between subject components.

According to Ross (1993:13), models of hypertext format may also facilitate the realisation of learning objectives according to Bloom’ s (1956) six levels of the cognitive domain, as illustrated in Table 2.3 below.

BLOOM'S TAXONOMY	LEARNER SKILLS	CORRELATING HYPERTEXT MODELS
Knowledge	Name, specify, state, define, list, label and write	Learner recalls or recognises information and principles in the form in which they were learned.

Comprehension	Identify, explain, restate, translate, describe and illustrate	Learner translates, or interprets information based on prior learning
Application	Apply, solve, use, compute, demonstrate, construct.	Learner selects, and uses data and principles to complete a problem with a minimum of direction.
Analysis	Analyse, compare, contrast, compare, separate.	Learner distinguishes, classifies and relates assumptions
Synthesis	Design, develop, plan, create, hypothesise	Learner originates, integrates and combines ideas into a product that is new.
Evaluation	Assess, evaluate, judge, predict, justify	Learner appraises, assesses, or critiques on a basis of specific criteria.

**Table 2.3 Hypertext and Bloom's taxonomy of the cognitive domain  
( Adapted from Ross, 1993:13 )**

### 2.3.3 WEB-BASED INSTRUCTION AND LEARNING STYLES

According to Parson (1998:3), identifying learners' learning styles helps educators to understand how people perceive and process information in different ways. Examples of such learning styles are based on learning style theories contrasts **field-dependence** and **field-independence** (Raven, et al. 1992:45). Parson (1998:4), emphasised that it is important to understand how the new technology can affect learning when different types of learners use it.

As the Web incorporates the diverse presentation of media including text, images, sound and video, it is possible to use it to deliver material that meets the needs of learners with any or all of these learning styles.

Koehl (Clark, 1998:13) recommends that instructional design should cater for more than the traditional learning styles. It should incorporate those learning styles not usually considered but now made possible through technology, e.g. content linear, content non-linear, synchronous communicator, asynchronous communicator, lesson prescribed and lesson interactive styles. All of these, she argues, can be facilitated in carefully designed Web-based learning material.

#### 2.3.4 INSTRUCTIONAL PRINCIPLES FOR WBI

To ensure a high quality course that is a comparable to an on-campus learning experience, May (1999:1-2) recommends the following seven instructional principles:

- *Produce an organised and interactive Web-based course* that will incorporate varied learning opportunities, by using multiple methods for the presentation of materials.
- *Use Active Learning techniques:* Prepare the learner by providing direction. Involve the learner and create relevant a learning situation which will challenge the learner, as well as encourage critical thinking and application of material.
- *Provide learning through interaction:* Give prompt feedback, provide opportunities for faculty-learner interaction and opportunities for peer interaction.



- *Communicate High Expectations*: Emphasise time on task and support unique learning styles. Respect diversity of thought and talents.
- *Utilise the richness of the Web* by linking the learners to course specific web resources.
- *Assessment*: Employ continuous assessment and quiz components to your course. Ongoing assessment feedback helps learners determine how they are progressing in the course.
- *Review and Revise*: Soliciting feedback from the learners for course improvement could assist in updating the course regularly. The web is a dynamic learning tool, keep content robust and current.

### 2.3.5 INTERACTION IN THE WBI ENVIRONMENT



This paragraph will describe the interaction that occurs in the WBI environment to enhance learning, as perceived by different authors.

#### 2.3.5.1 Interactive learning on the World Wide Web

The Interactive Federation Conventional Conference defines interactive learning as learner-centred learning using a multimedia approach (Barker & Tucker, 1990:18). Barker and Tucker further argued that interactive learning is a process, rather than a technology, implying the creation of an information-rich learning environment involving interactions between:

- People (teachers and learners);
- Print-based materials, typically produced using desktop publishing methods;
- New computer-based media, including hypertext/hypermedia, optical discs, satellite and cable.

Regarded as a powerful tool in enhancing learner interactivity, multimedia, is harnessed in a number of different ways:

- To prepare an interactive multimedia product for individual learning (one-to-one or one-to-few);
- To lecture (one to many);
- To prepare a presentation for delivery in real time or as a published product on disc.

Gibbons (cited in Barker & Tucker, 1990:21) argued that the integration of text, graphics, sounds, animation and video, addresses different learning styles, providing a truly interactive learning environment that learners can explore, add to and compose in, enabling them to become actively engaged in the learning process.



#### 2.3.5.2 Types of interaction

While interaction is as crucial for online instruction as it is for any other kind of teaching, online instruction may, in fact, offer wider opportunities and make stronger demands on learners' interaction than other types of interaction (Alden, 1998:33). Alden (1998:33) distinguishes between the following four types of interaction:

- **Learners interacting with materials:** The learners interact with instructional materials in the same way they would with computer-based instruction. Questions and answers are available to the learner without any need for the intervention of a live instructor.
- **Learners interacting with the instructor:** The emphasis here is that online learners can interact individually with their instructor/teacher in the same

way they would in a classroom. Interaction can be in the form of questions asked by the teacher and responses from the learners, or visa-versa.

- **Learners interacting with other learners:** Learners can work together on projects or in the same group exercises in private, or be monitored by the teacher. An example of this type of interaction prevails when learners work in pairs or small groups engaged in a ball session about the course content.
- **Learners interacting with subject matter experts:** In this situation learners gain a different perspective, based on the expert's special experience. It is equivalent to having a quest speaker in the traditional classroom.

It is doubtful that the learners' secureness in front of the computer in regard to the Internet literacy is guaranteed.



#### **2.4 A DEFINITION OF SECURENESS IN THE WBI CONTEXT AT INTER-MEDIATE PHASE**

According to the dictionary explanation, secureness is seen as effective security, whereby the learner is free to choose. The learner does not have innate norms by which to make his choices. He has to rely on an adult for help and guidance. For grade 7 learners to attain the required skills for a virtual classroom, the presence of the instructor is essential for guidance and ensuring secureness of learners in front of the computer. The grade 7 learners at St. Conrad's College are novice Internet users. The instructor, or any knowledgeable person should always be close to give assistance when the need arises. The research focused on the implementation of a virtual classroom delivered via the Web. In this situation the secureness of a learner in front of the computer is not guaranteed, therefore the presence of the instructor or any knowledgeable person in the computer laboratory is essential while learners are working with the virtual classroom.

However, the child first finds safety in the educator, then the educator takes the hand that the child has placed in his, in trust, and this hand accompanies the child so that the child effectively experiences security. In fundamental pedagogics, *thankfulness for experiencing safety* is regarded as one of the essences of the activity structure (Van Rensburg and Landman, 1992:474). The implication is that learners at the intermediate phase need assistance from their teachers when working on the Web, or for any referral purposes, and must go through the navigational metaphor under the supervision of the teacher. This will not ease the fear of making mistakes, but rather increase tension. The learners will explore more when conditions are secure or safe, free from worry or danger.

## 2.5 SUMMARY

This chapter contains a review of literature study on Web-based Instruction. A theoretical perspective was created and the framework in this regard focuses on the definition of WBI, a comparison of two approaches, the advantages and limitations of the Web, and features and components associated with WBI learning environments.

The didactical situation was explored, by giving an in-depth analysis of the literature, in order to identify pedagogical perspectives. Areas focused on were:

Learner acceptance of participation in the virtual classroom; Web-based instruction and cognitive learning objectives which focus on Bloom's taxonomy; WBI and learning styles, instructional principles and the interaction in the WBI environment (which forms the core of the study), followed by the analysis of the concept *secureness* in the intermediate phase. The next chapter will describe the design and implementation of the virtual classroom.

## CHAPTER 3

# DESIGN AND IMPLEMENTATION OF THE VIRTUAL CLASSROOM

### 3.1 INTRODUCTION

Mathew and Dohery-Poirier (1999:2) explain that taking full advantage of the potential of the Web requires teachers to think about learning and teaching in new ways, as well as to master the technology itself. However, Rosen (1998: [online]) points out that the WWW is merely a tool, as are a chalkboard, an overhead projector, or a VCR. When the Web is effectively implemented, it will assist in the learning process. Learners are anxious to know how to use the Internet to seek relevant information for their studies.

To assess the feasibility of the delivery of effective education via the Web, a project was planned and implemented for grade 7 learners at St. Conrad's College to answer the research question in paragraph 1.4. This project focused on the experience of learners who participated in a virtual classroom. It will be used to assess the reported strengths and weaknesses of Web-based Instruction that have emerged from the literature review, within the context of the implementation at St. Conrad's College.

### 3.2 THE CONTEXT OF THE IMPLEMENTATION OF A VIRTUAL CLASSROOM

The context of implementation refers to the school, class, subject and aim, which are discussed in the following paragraphs:

### 3.2.1 THE SCHOOL

The St. Conrad's College was the school where the study was carried out and comprises secondary, primary and foundation phases. A virtual classroom was created for the implementation of Web-based Instruction lessons for grades 7 and 8.

### 3.2.2 THE SUBJECT

An information technology in education curriculum is implemented in this school to enhance learners' computer skills, Internet skills, reading and understanding skills. The school also uses various other courseware to complement learning in the traditional classroom.

### 3.2.3 THE PARTICIPANTS



The learners at St. Conrad's College attend school on a full-time basis and do not have access to the virtual classroom outside the school setting. The grade 7H virtual classroom is structured around the grade 7 and 8 syllabi and has the following features:

- A home page with various links and graphics;
- Clearly defined project and instruction pages;
- A communication forum page;
- An e-mail page of the learners and instructor; and
- A due date or announcement page.

The sampling of the participants is indicated in the table shown below:

CHARACTERISTICS	DESCRIPTION
Gender	17 girls 15 boys
Age range	12 to 15 years
Learner status	Full-time learners (grade 7H)
Computer literacy	Learners are computer literate in the use of hardware and <i>MS Word, MS Access and Desktop Publisher</i> .
Internet literacy	Some are still struggling to access specific sites on their own and need guidance.

**Table 3.1 An overview of the characteristics of the learners of grade 7H**

### 3.2.4 THE AIM

The aim of global information - the information superhighway - is to have an impact on important areas, such as the access to information, freedom of expression and opinion, universal literacy and lifelong learning (Grabe & Grabe, 1996:48). The courseware used for creating a virtual classroom is *Microsoft Front Page 98*, and the lesson content is based on *Microsoft Access, Microsoft Word and Desktop Publisher* as well as *Internet skills*.

### 3.3 THE DESIGN AND DEVELOPMENT OF THE VIRTUAL CLASSROOM

Virtual classrooms could be designed and developed with many components bearing various characteristics. In this regard, a virtual classroom was created/ designed to be user friendly and consisted of five pages including the home page. Graphics, related to the content in each page, are used to guide the learner. The design also displayed both text and animation, but learners were not expected to change or alter the virtual classroom. A folder was created for saving all the graphics to be used in creating a virtual classroom. A home page created with some graphics and text was hyperlinked to specific pages of the

virtual classroom. The e-mail addresses of the researcher and the instructor also appear on the home page.

### 3.3.1 DEVELOPMENT APPROACH

Web pages are created in different ways and forms, but for this study dedicated HTML editing was chosen and is explained in the following paragraphs. HTML editors enables Web page designers to design Web pages without having prior knowledge and skills of HTML. Editors such as *Front Page*, *Hot Dog Professional*, and *Hot Metal Pro*, can be used to create Web pages (Alden, 1998:23).

Alden (1998:23) indicates that most of these editors use menus and drag-and-drop capabilities to construct the necessary coding, which normally include a WYSIWYG interface ("What you see is what you get"), meaning that the viewer can see what the page would actually look like on a browser. The researcher used *Microsoft Front Page* to create the Web pages of this virtual classroom.

In this regard, a virtual classroom was created or designed to be user friendly and consisted of five pages including the home page. Graphics relating to the content in each page was used to guide the learner. The design is based on text-only viewing. Various animations were used where applicable. A folder was created for saving all the graphics to be used in creating a virtual classroom. A home page created with some graphics and text was hyperlinked to specific pages of the virtual classroom. The e-mail addresses of the researcher and the instructor also appear on the home page. The researcher used *MS Front Page* to create the Web pages of this virtual classroom.



### 3.3.2 DESIGN CONSIDERATIONS

The layout and appearance of the Web pages will have a significant impact on the actions of the learners (Alden, 1998:16). The Web page is, above all, a teaching tool, so it should be appealing and easy for learners to use. The content on the computer monitor should be readable and able to engage the learners' attention in presenting the content. Criswell (1989:83) reported that people read 25% faster from paper than from a computer screen.

The design of a good Web page is based on general design principles as indicated by McCormack and Jones (1998:80-85):

- **Concentrate on content.** The design of the interface should not distract from the content. Animation and other flashy elements used for decoration on the screen easily disturb the user from concentrating on the content.
- **A good design is a simple one.** The page layout should be kept clean and simple, which means that graphics, bullets, headings, etc., should be used discerningly. The aforementioned elements were used wisely and selectively.
- **The text should be legible.** Appropriate use of colour and good choice of fonts and font sizes. Size 12 fonts were used in this regard.
- **There should be consistency.** A Web-based classroom should be consistent throughout in terms of the design layout of pages and navigational links. This made it easier for the learners to navigate the system.
- **Be accurate.** Spelling must be correct at all times, and "dead" or not functioning links distract the user. A spell check function was activated to ensure that all words were correctly spelt.
- **There should be uniqueness.** When a Web-based classroom has a unique look, it is easy for the users to associate it with a specific lesson or

project. The learners will be quite familiar with a virtual classroom in terms of access and navigation.

- **The appearance of a Web page must match the purpose of the page.** The content and the appearance of the virtual classroom matched.
- **Give visual clues.** The appearance of icons and how well they provide users with necessary visual clues.

The home page of the virtual classroom on page 35 clearly indicates that the above considerations, as suggested by McCormack and Jones, were considered when the virtual classroom was designed.

### 3.3.3 ORGANISATION AND PRESENTATION OF MATERIAL

According to McCormack and Jones (1998:67), a website comprises two structures being, namely, the *presentation structure* and the *storage structure*. The study will focus mostly on the presentation structure, as it is user friendly, defines how a visitor to the site can access and traverse the Web-based classroom, and the quality of presentation will influence whether or not visitors can find what they are looking for or not.

The presentation structure is a combination of "*look and feel*" of the pages in a Web-based classroom and the navigational paths the user can take through the site. The presentation structure defines how a user to the site can access and traverse the Web-based classroom. However, the selection of an organisational structure depends on the nature of the intended audience (Oliver, 1998:30), which might either be novice or expert users.

### 3.3.4 NAVIGATION IN THE VIRTUAL CLASSROOM

According to Alden (1998:28), the term *navigation* refers to the process of using links to help the learners move through the materials that make up a course. Alden (1998:29) reports that there are four functions used in navigation:

- *Table of contents* - with each unit title serving as a link;
- *Sequence Control* - use of a standard button bar on each page that allows the learners to go to the “*next*” page or return to the “*previous*” page in the normal sequence;
- *Side Trips* - learners can take excursions into hyperspace searching for relevant information in respect of the given task;
- *Retracing steps* - all browsers provide “*Back*” and “*Forward*” buttons that allows learners to move backward and forward along the path through the pages that they have already taken.

In a virtual classroom design, the *home page* is the orientation page for the whole class. The home page consists of all the links to the different pages of the virtual classroom. Navigation starts from the home page and is stable. This page also serves as the table of contents to various pages of the virtual classroom.

### 3.4 DESCRIBING THE VIRTUAL CLASSROOM

The Web-based classroom was designed to enhance learning and interaction between the learners and the instructor.

### 3.4.1 THE VIRTUAL CLASSROOM COMPOSITION

The virtual classroom comprises the following components: a grade 7 & 8 home page which has five links that linking to different components of the virtual classroom. These are:

- Class information;
- Due date;
- Forums;
- Sites to be visited on the Internet, and
- The task to be completed.

Figure 3.1 is a representation of the lesson Web page. Graphics and text are hyperlinked to a specific component of a virtual classroom are described below.

#### 3.4.1.1 Grade 7H Information

This page consists of the class information, the e-mail addresses of the learners and lesson expectations.

#### 3.4.1.2 Calendar

The announcements in this page include the due dates for projects and sub-sections of the main project.

#### 3.4.1.3 Links

Here the teacher recommended the sites to which learners could refer to obtain information with regard to the project. Learners will visit these sites for obtaining information. They will also get instructions with regard to *MS Word*, *MS Access*, *Paint* and *Internet* sites.

#### 3.4.1.4 Communication forum

This is a site where learners communicate with one another about certain steps of the project. The discussion forum titled “Weather” for academic work only! For social communication, learners were allowed only two messages to be sent to classmates under a forum called “Greetings and Assistance”.

#### 3.4.1.5 Tasks

Tasks will be all the work components that the learners are expected to complete and submit to the teacher via the Web. The whole process was taking place electronically in a virtual classroom.

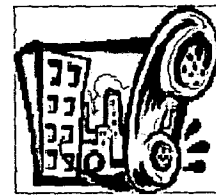
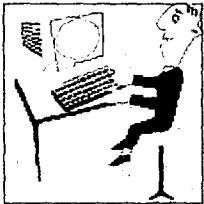


**Figure 3.1 The home page of the virtual classroom**

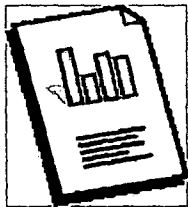
## St. Conrad's College Grade 7h Virtual Classroom



### Welcome to Home Page



#### Emails



#### Forums



#### Due Dates

#### Links



#### Project

Instructor: Mrs Sue Van Zyl

Researcher: MJ Sesemane

[sue@st-conrads.co.za](mailto:sue@st-conrads.co.za)

[2170594@student.rau.ac.za](mailto:2170594@student.rau.ac.za)

### **3.5 IMPLEMENTATION OF THE VIRTUAL CLASSROOM**

Thirteen weeks into the Web-based Instruction lesson (i.e. when the observation started) most of the learners expected the instructor to lead them through the lesson step-by-step. For example, learners would ask for help on a techniques that had been demonstrated earlier. This indicated that the learners were not yet ready to explore, experiment and make mistakes on their own. Some did not feel confident enough to make any mouse-click without the assistance of a knowledgeable person at their side.

Gradually various sites of the virtual classroom were introduced to the learners, moving from one page to the other was problematic for some learners. It was emphasised that the home page should serve as a table of contents. The instructor had to demonstrate in the event that learners were unsure. From the fourth week onwards, the learners adapted and showed positive signs of participating and minimised anxiety, improvement in their secureness and independence in front of the computer. At certain stages technical problems cropped up and the learners panicked, as their e-mail addresses had not been correctly installed.

Technical problems that might cause learners to panic, are explained in detail in paragraph 5.2.3.

### **3.6 SUMMARY**

This chapter explored an overview of theory in research of Web-based Instruction to generate a theoretical framework for research methods and techniques within this study. Secondly, this chapter explains the context on the implementation in a simulated scenario, the design and development of the virtual classroom, as well as the description thereof.

The research design of the study and the qualitative approach, followed by data collection techniques and analysis will be discussed in chapters 4 and 5, respectively.





## CHAPTER 4

### THE RESEARCH DESIGN OF THE STUDY

#### 4.1 INTRODUCTION

The purpose of this chapter is to describe the research design that was followed in order to answer the research question identified in chapter one. The collecting, recording and interpreting of the data that was used in this research project will be focused on. Research is defined as a systematic process of collecting and logically analysing information for some purpose (McMillan & Schumacher, 1993:8).

#### 4.2 PURPOSE OF THE RESEARCH

The purpose of this study is to determine whether Web-supported learning course will increase Grade 7 learners' skills and knowledge of Web-based Instruction as well as positively influence their attitudes towards the Internet and Web-based learning.

#### 4.3 RESEARCH DESIGN

The aim of a research design is to plan and structure a given research project in such a manner that the eventual validity of the research findings is maximised (Mouton & Marais, 1994:33).

This study used qualitative research design approach to examine the effects of Web-supported learning of Grade 7 learners' attitudes towards web-based Instruction and their acquired skills and knowledge of the use of web tools in education. As this study is based on a qualitative research approach (refer to

paragraph 1.6) and is as such descriptive, exploratory and explanatory (Mouton & Marais, 1994:43). According to Novak-Aitken (1994:102), qualitative research is a method that provides a way to understand complex social phenomenon such as technology, and the preparation of best learners with greater clarity and understanding. Hence this approach has been selected to understand the experiences of novice web users.

This study is focused on understanding how learners experience Web-supported course at St. Conrad's College. The qualitative design is an approach that focuses on human experiences. Since human experiences are complex (Burns & Grove, 1995:393), this approach then will view the learners' experiences in a holistic manner. Learners in this study will describe their experiences through qualitative interviews.

**Descriptive** research design aim at the researches' goal, which is to describe that exists as accurately as possible and the choice of either ideographic or nomatheric strategies (Mouton & Marais, 1994:44). The researcher described the learners' perception of web-supported learning as compared to conventional teaching in chapter 5 (findings and results).

The learners will describe their perceptions of Web-supported lessons in their school. This is to enable them to present an accurate description of what is being studied. The intention is to try and reconstruct reality from the experiential world of the learners, so to understand them better. Further, as the learners describe their perceptions, the researcher will be cognisant of inter-personal situations that provide data towards the understanding of the phenomena being studied.

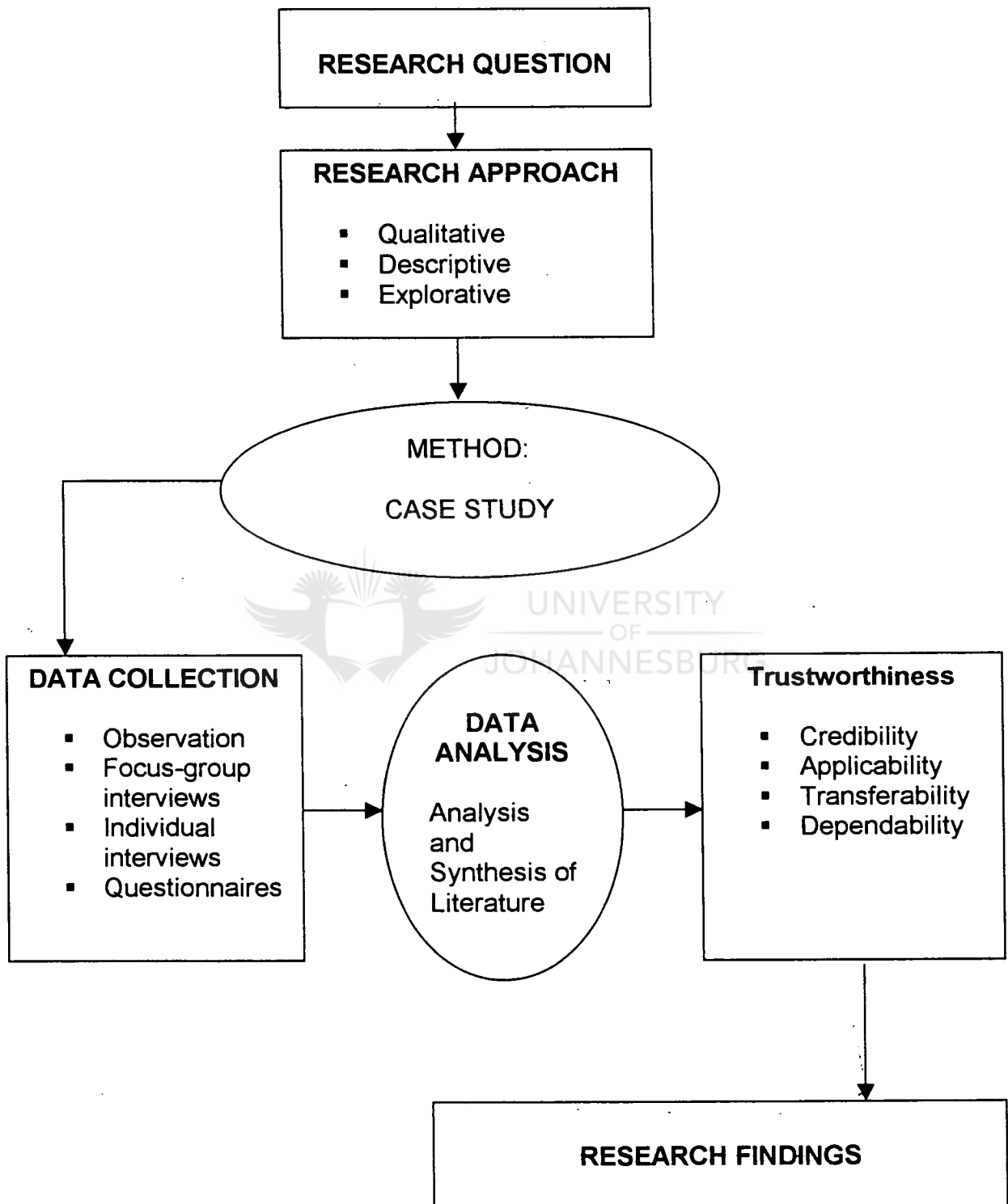
**Explorative** research aims at he exploration of a relatively unknown research area, therefore in the context of this study, web-supported learning can be considered as a relatively unknown field of study. The lesson has been

planned, whereby grade 7 learners are to explore the capabilities of WBI in supporting conventional learning approach. Learners are expected complete a given project learning via the web on their own.

The nature of qualitative research is oriented towards exploratory discovery (Morse & Field, 1995:126). The qualitative exploratory approach will enable the researcher to share in the understanding and perceptions of others and to explore how people structure and give answers to their daily lives (Berg, 1995:7). Therefore, the researcher will be able to hear from the learners how they experience Web-supported course at St. Conrad's College.



Figure 4.1 A diagram illustrating the research design of the study.



#### 4.4 RESEARCH METHOD

The research method in this study is that of a case study. This study involved an in-depth investigation of the implementation of a Web-based Instruction course at St. Conrad's College. Learners were observed and their responses in the questionnaires, as well as their performance in the project given, were analysed to determine the effects of a Web-based Instruction course.

The nature of this study is explorative and descriptive as this is the first time that the course is offered to grade 7 learners at St. Conrad's College. The technology centre in this institution was officially opened in 1998. The learners are urged to enrol for information technology in order to acquire computer skills. The school has implemented the curriculum of *Futurekids*, which is outcome-based, for both Primary and Secondary phase. The computer skills acquired during computer lessons are later employed in projects given by subject teachers, during conventional teaching for presentation, using some of the tools and resources.

The essential characteristics of the case study are listed below:

- According to McMillan and Schumacher (1993:37), a case study involves an investigation of a single "case", studied in-depth. However, data consists of words in the form of rich verbal description, rather than numbers. A case investigated here is a Web-supported course at intermediate phase. Grade 7 learners will, for the first time, participate in a virtual classroom. The case study investigates the interaction between the learners and the teacher, the interaction among the learners themselves, as well as the learners' secureness in their participation in a virtual classroom.
- Merriam (1998:16) summarised the qualitative case studies pointing out that a case study is an intensive entity, phenomenon, or social unit. She further

indicated that case studies are particularistic, descriptive and heuristic, and rely heavily on inductive reasoning in the handling of multiple data sources.

#### **4.5 DATA COLLECTION TECHNIQUES USED IN THIS STUDY**

The study used various data collection techniques for analysis and collection purposes. McMillan and Schumacher (1993:43) assert that more than one technique can be used to collect data in a single research case or case study. Furthermore, these different qualitative techniques could provide verbal descriptions, the goal of each being to capture the richness and complexity of behaviour that occurs in natural settings.

The data collection techniques in question are described in the following paragraphs:

##### **4.5.1 OBSERVATION**

Grade 7H learners were, as experimental group, briefed at the initial stage with regard to the implemented virtual classroom in the computer laboratory and the research project. They were urged to be independent as they would be “observed” indirectly. Since an Intranet situation was used, simulating the Internet, the learners were therefore encouraged to participate in the virtual classroom. By communicating electronically, i.e. by sending e-mail to the instructor and classmates, Internet skills would be indicated.

According to McMillan and Schumacher (1993:43), observation has the distinctive feature of observing phenomenon in naturally occurring situations over an extended time and writing extensive field notes to describe what happened. There will be various responses, as learners will complete a researched project in a virtual classroom. The researcher will carefully document the effects of the findings.

#### 4.5.2 FOCUS GROUP INTERVIEW

The learners attend a focus interview after completion of the project. A question was raised to start the conversation, aiming at obtaining the learners' experiences and perceptions of Web-based Instruction. The context of the question was based on the conventional approach of teaching and online supported teaching. Other sub-questions or hypotheses emanated during the interviewing process.

The entire interview was recorded (Appendix B contains a transcript of the interview).

#### 4.5.3 INTERVIEWS

In this study interviews were used to follow up on observation and focus group interviews. McMillan and Schumacher (1993:426) have identified the following three methods:

- The formal interview;
- The interview guide approach; and
- The standardised open-ended interviews.

The interview styles that have been reported in this study were formal conversational interviews with the teacher. In the formal and standardised open-ended interview, structured and semi-structured questions were prepared and designed to gather data about learners' interests, dependency and confidence towards learning via the Web, and also to determine the strengths and the weakness of Web-based Instruction (see Appendix C).

The learners were sampled by “case type”. According to McMillan and Schumacher (1993:382) a case refers to an in-depth analysis of a phenomenon and not the number of people sampled.

Individual interviews helped the researcher to gain a deeper understanding of particular issues based on the project completed by the learners. Specific areas of interest on the side of the researcher could not have been touched upon in the case of open-ended interviews. Therefore it is necessary to interview specific learners in this regard. The learners were interviewed on the last day of their final submission of the project.

#### 4.5.4 QUESTIONNAIRES

According to Tuckman (1994:214) the questionnaire is an approach that is used to measure the participants' knowledge, value, attitudes and beliefs. However, there are problems associated with this technique, especially when measuring the knowledge and attitudes of the participants' perception of what they think they know, compared to what they really know and may present conflicting data. Tuckman (1994:216) supports this idea as he noted that: “the questionnaire does not measure what people believe, not what they like, but what they say they master.”

At the end of the course the learners completed a questionnaire with regard to their Internet and computer literacy in general. The questionnaire aimed at informing the researcher as to how a case study was approached, based on the learners' experience and performance within a Web-based Instruction course (see Appendix D).



## 4.6 DATA ANALYSIS

Data analysis is a process of making sense out of one's data, and this could be achieved by consolidating, reducing, and to some extent, the interpretation thereof (Merriam, 1998:127). The goal of data analysis is to come up with reasonable conclusions and generalisations based on a preponderance of the data.

At this data analysis stage of the research, the researcher will type verbatim transcriptions of the whole data like interviews. The researcher has to dwell on, or be immersed in data (Streubert & Carpenter, 1995:465). Thus, the researcher needs to read and re-read the verbatim transcriptions and play and re-play the audio-taped interviews to get the themes, concepts and ideas of the learners' experiences of Web-supported learning at St. Conrad's College.

An experienced coder, who will analyse the data independently from the researcher, will assist the researcher with the analysis of the data. They will then meet to have a consensus discussion on the analysed data. The researcher and independent coder will use the open-coding method of data analysis.

The researcher shall employ the different ways of open coding, (Tesch's, method cited in Creswell, 1994:155). The method involves the following steps:

- Getting a sense of the whole. Reading through all the transcripts carefully. Writing down some ideas as they come to mind;
- Choose the most interesting, shortest document and go through it, asking oneself what it entails whilst underlying the meaning. Thoughts are to be written in the margin;

- Having completed all the documentation, list all of the topics. Group similar topics together and arrange them into major topics, unique topics and those left over;
- Take a list, go back to the data, abbreviate topics as codes and write the codes next to the appropriate segment of the text. This will enable one to realise new categories and codes;
- Find the most descriptive wording for the topics and turn them into categories. Group topics that relate to each other together. One may draw lines between categories to show relationships;
- Make a final decision on the abbreviation of each category and code them alphabetically;
- Data material belonging to each category should be assembled and put in one place for preliminary analysis; and
- Record existing data.

With the assistance of the coder, the analysed themes, concepts and ideas will be discussed. An effort will be made to try and reach consensus on the similarities and differences among the themes, ideas and concepts. Finally, the results were transcribed and recorded.

#### **4.7 THE TRUSTWORTHINESS OF THE RESEARCH**

The researcher will ensure that a measure of trustworthiness will be observed in this study by using the research strategies, i.e. the approach includes four criteria, namely, truth value – credibility, applicability using transferability; consistency using dependability; and neutrality using confirmability (Krefting, 1991:214).

#### 4.7.1 THE STRATEGY OF CREDIBILITY

Krefting (1991:215) asserts that the credibility strategy is obtained from the findings of the research as authentic experiences of the learners of Web-based Instruction, as lived and perceived by informants. The credibility strategy comprise the following criteria:

- **Prolonged engagement:** The researcher will put the respondents at ease to verbalise their experiences. The situation will enable the respondents to reveal even uncomfortable facts about their experiences of Web-supported learning.
- **Reflexivity:** Burns and Grove (1995:385) postulate that this is a process whereby the researcher explores personal feelings and integrates his understanding into the study. As the researcher is part of the research and cannot be separated from it (Krefting, 1991:218), and to minimise his feelings and experiences from influencing the study, reflexivity will be promoted. To give evidence to the reader about the findings that are presented in this study, reflexivity will be achieved through the use of audiotape and interview notes.

#### 4.7.2 THE STRATEGY OF TRANSFERABILITY

This strategy is used to determine whether the findings can be applied in other contexts, settings or with other groups (Morse & Field, 1995:220). Potential appliers of the findings will have to rely on available data from this study, to ensure transferability. Criteria to ensure transferability:

- **Nominate sample** – the purposive sample method is used in this research.

- **Dense description** – the dense background information about the respondents and research context has already been given. According to Krefting (1991:220) this will enable others to assess how transferable the findings are to another settings.

Transferability implies that the findings and results of the study might not relate to other situations. The representative of situational context serves as a deciding factor.

#### 4.7.3 THE STRATEGY OF CONFIRMABILITY

To ensure that the data reflects the learners' experiences and perceptions of a Web-supported course or WBI, the researcher will ensure confirmability through prolonged engagement, reflexivity and a confirmability audit. With the assistance of an independent, qualitative researcher to analyse and reduce the data, the researcher compared it with his data and came-up with one category representing learners and teacher experiences of a virtual classroom.

#### 4.7.4 THE STRATEGY OF DEPENDABILITY

Morse and Field (1995:118) argued whether the findings would be consistent if the enquiry were replicated with the same subjects or in a similar context. The focus will then be on the research design and method that has already been discussed. Criteria for dependency strategy:

- **Auditable** - this is when another researcher can clearly follow the decision trail used by the original investigator in the study (Krefting, 1991:221). The relevant data will be kept to promote an audit trail.
- **Code-recode procedure** - the researcher and coder will discuss the collected data to reach consensus about the learners' perceptions of Web-supported learning.

At the end of the research, a group discussion was held with all the participants to find out that the findings were credible enough. Questions were asked, and from the responses it was noticed that the project was complex because of technical, on-line communication and motivational issues. The results are comparable with the existing theory as are shown in the literature.

#### **4.8 SUMMARY**

The chapter gives an overview of a theoretical framework for research methods and techniques within this specific field. The research design of the study, approach that was employed in the study, data collection techniques and analysis were fully described as well as the research strategies used, were described. Lastly, the trustworthiness was also explained.



## CHAPTER 5

# RESEARCH FINDINGS AND RESULTS: LEARNER AND TEACHER EXPERIENCE OF THE VIRTUAL CLASSROOM

*“Research is best conceived as the process of arriving at dependable solutions to problems through the planned and systematic, collection, analysis, interpretation of data”. (Cohen & Manion, 1980:29)*

### 5.1 INTRODUCTION

The purpose of this chapter is to present the findings of the research question which have been identified in this study. The learners’ perceptions based on how they learned in the virtual classroom, and the teacher’s experience of teaching in the virtual classroom, are discussed in the following paragraphs.

### 5.2 LEARNER EXPERIENCE OF THE VIRTUAL CLASSROOM

Data analysed in order to determine the learners’ experience of the virtual classroom generated the following categories: learner expectations were realised; learners had both positive and negative perceptions of interaction; learners were generally positive about their experiences; learners had varied experiences of secureness in the virtual classroom and learners generally preferred the virtual classroom to conventional teaching. These categories are now discussed.

#### 5.2.1 LEARNER EXPECTATIONS WERE REALISED

The learners’ expectations of what they would gain from the lessons included:

- The development of their knowledge and capabilities;

- Learning how to use applied technology to enhance their learning experiences;
- Gaining insight into possible pitfalls.

At the end of the whole project most learners reported that they had fulfilled expectations, although some were still uncertain as to whether these expectations were fulfilled. The following software was used to complete the project: *MS Word, MS Access, Paint and Internet sites.*

#### 5.2.2 LEARNERS HAD BOTH POSITIVE AND NEGATIVE PERCEPTIONS OF INTERACTION

A social forum was created whereby the learners could introduce themselves and get opinions of others about the virtual classroom. Of a class of thirty-two (32) learners, seventy-six (76) messages were posted on the first day, which indicated an eagerness to participate in the meaningful interaction. Some of the learners were astonished by the manner in which the instructor responded to their messages. She portrayed patience and a willingness to help at all times. *“Our instructor is always helpful and eager to assist when the need arises”*. Some learners did not communicate with the instructor electronically and missed an experience of meaningful interaction.

The virtual classroom promoted more meaningful interaction between the instructor and learners, and the learners themselves, than in a normal classroom situation. *“I can interact with anyone during the lesson without disturbing the whole class – unlike in the face-to-face situation”*. Few learners were of the opinion that there was freedom of expression in the virtual classroom, while the interaction amongst the learners with regard to the support and help was not evident enough. It appeared that they relied more on knowledgeable persons than on themselves. *“It was not easy to ask for help or*

*get support from the classmate, as the virtual classroom was a new approach to all of us”.*

Some learners experienced interaction as inadequate in the virtual classroom as compared to face-to-face interaction. *“If there is no one to respond to your question, it is frustrating and disappointing, whereas in a face-to-face the teacher will give an individual attention as soon as your hand is up”.* The main problem was keyboard skills, especially fast typing. *“I felt lonely and isolated, even felt like expressing myself verbally”.* They needed feedback or encouragement to continue with the project.

Most of the interaction between the learners was about the feelings and attitude towards this new approach. *“I was not compelled to respond immediately, I could do certain steps in a project and respond later or thereafter”.* Lastly, the learners indicated the need for more face-to-face with the instructor. *“It is not easy to adjust overnight to this new approach and master it”.* The pre- and post questionnaire was used to assess the knowledge and skill of sending e-mail. Learners were to send each other e-mail before and after the lesson to assess their skills in this regard.

The results of the pre- and post questionnaire are presented in Table 5.1 on page 58.

### 5.2.3 LEARNERS WERE GENERALLY POSITIVE ABOUT THEIR EXPERIENCES

At the end of the project most learners reported that their expectations listed in 5.2.1 had been fulfilled, although some were still uncertain about this. Most of the problems experienced were related to technical issues beyond the learners' control.



The learners who completed the course considered the marks obtained as a fair reflection of their knowledge and abilities:

- Whether the virtual classroom marks were among their best marks or not; and
- Whether the learners completed the Web supported project or not.

They all expressed enthusiasm about how much they had learnt and benefited from the lesson, its approach and methodology.

#### 5.2.4 LEARNERS HAD VARIED EXPERIENCE OF SECURENESS IN THE VIRTUAL CLASSROOM

Learners' secureness in the virtual classroom at intermediate phase were not expected to be the same as for most other novice Internet users. The results of the data gathered from the questionnaires, observation periods and the interviews suggest that learners were not yet secured to explore the virtual classroom on their own. They pleaded that the instructor should kindly be lenient towards them. As one learner said *"The instructor should be kind to us because we never experienced the virtual classroom before"*.

##### 5.2.4.1 Dependency on instructor

- Of the thirty-two learners who responded to the question of dependency during the lesson project, 59% indicated that they always ask for help in their Web-supported learning class. This suggests that there are more learners who need support during classes, especially those who cannot practice at home.

- Information gained from the questionnaire coincides with the data gained during observation. Thirteen weeks into the Web-supported lesson (i.e. when the observation started) most of the learners expected the instructor to lead them through the lesson step-by-step. For example, learners would ask for help on the same technique, which had been demonstrated earlier. This indicated that the learners were not yet ready to explore, experiment and make mistakes on their own. Some did not feel confident enough to make a mouse click without the assistance of a knowledgeable person by their side.
- During the formal interview, eleven learners indicated the need for individual attention in the virtual classroom. This was difficult given the realities of the virtual classroom whereby each learner had to respond on the instruction given by the instructor to complete the project. The only alternative was for them to e-mail the instructor to seek clarification.



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#### 5.2.4.2 Co-operative groups

The instructor encouraged co-operative groups of two, especially where some computers were not functional. Some learners welcomed an opportunity to work in co-operative learning groups, as it gave them the opportunity to seek support from fellow participants in a face-to-face situation, rather than be online. During informal interviews, four learners pointed out that their fellow participants became too dependent on them and that slowed their progress: *"...it was frustrating to share or work in groups ...as it slowed the progress because we gave chance to each other."* These sentiments were shared by the instructor, indicating that other learners do not get enough practice at home, as many parents could not afford a computer, let alone the Internet. When asked about the weakness of Web-supported learning, the instructor was of an opinion that some learners always restrained the progress of the faster learners who had Internet experience.

Although there are advantages to co-operative learning, it was noticed that some learners did not benefit much from this situation. *“Some groups did not function well.”* These learners stayed in the background and watched as their partners explored. However, this problem was alleviated by employing pure strategic co-operative learning groups, where secureness or positive independence was promoted. This was achieved by ensuring that every learner became accountable for his own learning in the group process. Johnson and Johnson (1992:122) suggest that all learners within the group can gain only if the groups are well structured, where a mutual goal is set and each learner is responsible for the other’s learning and success, as well as their own.

#### 5.2.5 LEARNERS GENERALLY PREFERRED THE VIRTUAL CLASSROOM TO CONVENTIONAL TEACHING

Learners’ comparison of these two approaches yielded three categories: Visualisation versus the spoken word, information available versus focus of learning and advantages of Web-supported learning. These categories will be discussed in the paragraphs to follow:

##### 5.2.5.1 Learners enjoyed visual information

Analysis of the interviews indicates that the aspect to which learners referred mostly, as far as Web-based Instruction was concerned, was visual display and the teaching approach as compared to conventional teaching. The following example is an illustration: *“What I found interesting was that in class one receives information or teaching verbally or in material form; but with the graphics one can visualise the process taking place - especially when you click on specific words or graphics, it takes you to another site, to see what you what to explore”.*

Comments that visualisation and animation of graphics assist retention and better understanding of the content. Focus group 2 had the following example: *“This approach of teaching is good when compared to the conventional because you see it happening as the links will lead you where you want to be – unlike in face-to-face teaching where one will imagine a situation in question – not see it”.*

#### 5.2.5.2 The use of available information for learning purposes

The learners first pointed out the problem of workload, because of the amount of information available on the Internet. *“You don’t focus only on what you are searching for .... You find yourself wasting time on something else that interests you, this occurred when one was searching for different weather condition from the address provided”.* Loss of focus by the learners mounted to time loss.

#### 5.2.5.3 Advantages of Web-supported learning

The learners identified the following areas where Web-based Instruction could help them:

Learners were motivated and encouraged learning via the Web. *“... it excites and develops interest and develops personal benefits ...exposure to new technological world.”* The flexibility of the virtual classroom was more convenient. *“One was working at one’s pace and the virtual classroom promotes self-discipline.”* The relevancy of the subject content in the virtual classroom was informative, interesting and challenging in terms of computer skills and kept every learner busy and eager to e-mail his/her project to the instructor for evaluation.

Some learners pointed out the benefits of graphics and animation of the virtual classroom to understanding and integrating the concepts as follows: *“Visual stimulation makes easier to understand, graphics improve concentration and retention. The screen is more interesting than a textbook; and one learns faster.”*

### 5.3 LEARNERS IMPROVED THEIR SKILLS

**Question: Indicate your ability to: Send and receive e-mail**

Rating	Not at all		Low		Average		High		Very high		None	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Project Questionnaire												
No. of learners	26	3	18	5	22	30	0	1	0	0	4	7
Percentage	72	2	53	4	69	96	0	1	0	0	3	5

**Table 5.1 Learners e-mail skill performance**

The positive and negative aspects emanating from the questionnaires:

**Positive aspects:**

- Contact through the e-mail list resulted in more interaction with the instructor and other learners than would have been possible in conventional teaching (seven learners).

- The virtual classroom provided regular access to learners with same interest (eleven learners).
- Feedback, comments and moral support from other learners and the instructor via e-mail was useful for the new learning approach (sixteen learners).
- Attending the virtual classroom proved inspiring and motivating to the learners, who worked after hours to complete the project in the absence of the instructor (eight learners).

### **Negative aspects**

- The absence of an initial face-to-face for lesson introduction, made the situation difficult (twenty learners).
- Unreliable, unstable e-mail and Internet links caused frustration (ten learners).
- The Internet link from outside the school setting increased frustration (five learners), as they could not understand that the situation was a **simulation**, where an **Intranet** was used.

## **5.4 TEACHER EXPERIENCE OF THE VIRTUAL CLASSROOM**

The researcher conducted an informal interview with the instructor and one class teacher of grade 7. The qualitative techniques were used to analyse the data from the transcribed interview. From the analysis, two categories were identified:

- Responses towards the strengths of the virtual classroom, and
- Responses towards the weaknesses of the virtual classroom.

The responses were transcribed as follows:

#### 5.4.1 TEACHER EXPERIENCE OF THE STRENGTHS OF THE VIRTUAL CLASSROOM

Both teachers agreed and believed that the virtual classroom is inspirational for effective interaction. The responses of the instructor to the questions asked by the learners influenced more interaction. *“More interaction occurred on a learner to learner situation, than when one is teaching a large group of learners. Time constraints per period do not allow me to respond to every message, it takes time, but I enjoy”*. The virtual classroom promotes more self discipline as it expect learners to construct their own knowledge from the information gathered from the Internet. To complete the project given, the learners were expected to search for information from the Internet and the same project was to be submitted via the Web. The feedback was also done electronically. *“To some of the learners, this approach is difficult at the beginning for them to adapt. They wanted to revert to a face-to-face situation, until they get it right and enjoy it”*.

The virtual classroom serves a great deal as it reduces the workload of explaining instructions, etc., but it also carries the same pedagogical dimensions differently and more affectionately. *“Aspects like lesson plan of structure in a conventional teaching is represented differently from the design in the Web. Motivation is differently carried out as to the face-to-face situation, theories, etc.”*.

#### 5.4.2 TEACHER EXPERIENCE OF THE WEAKNESSES OF THE VIRTUAL CLASSROOM

The learners did not start well because of a lack of preliminary preparations for the virtual classroom. Since it was a simulated situation, and intranet was used and e-mail address for the learners were not correctly updated. However, the instructor admitted. *“The people who were to assist in preliminary preparations did not honour the first appointment, we had to start with the other convenient section. Communication was verbally and face-to-face due to technical problems”*. Some learners were left far behind even though the class teacher was supervising. Knowledge of what is expected from the learners must be known by the supervising teacher. *“If the class teacher does not understand the expectations, it become chaotic, especially when learners experience technical problems, and this affects the pace of deployment of new content in the virtual classroom”*.

Effective support was given to battling learners and, as result, they were indirectly disadvantaged, as the virtual classroom needs more confidence and less dependency. *“I felt bad if a learner is struggling and I just go and help”*. Even though the instructor expected the learners to help themselves, she was more sympathetic and helped them when the need arose.

#### 5.5 SUMMARY

The findings of this study indicate that the learners perceived the lesson with different degrees of enthusiasm and anxiety. Some learners were motivated to compete while others feared the Intranet simulating the Internet. In summary it can be said that the project lesson reinforced positive feelings about learning



via the Web, and helped other learners to overcome their anxiety. It was rather strange to realise that the level of secureness or independency did not decrease towards the end of the project lesson, despite the fact that learners' rating of their web confidence modestly fluctuated. There was a slight increase in Web or Internet confidence.



## CHAPTER 6

# OVERVIEW OF THE STUDY, CONCLUSION, DEFICIENCIES AND RECOMMENDATIONS FOR FURTHER RESEARCH

### 6.1 OVERVIEW

The purpose of the study was to investigate and report on the inter-activeness of a whole study project that was presented, via the Web (simulated), to grade 7 learners who had limited or no experience of the Internet, in the South African context. The aim was to determine or assess their Internet skills through meaningful interaction, the level of secureness or dependency at intermediate phase and the effects of a virtual classroom, as opposed to face-to-face teaching. This chapter briefly summarises the findings, the limitations of the study, and offers recommendations and suggestions for further implantations or research.

### 6.2 CONCLUSION

The research instruments used in this research were those of observation, questionnaires and interviews. The main purpose of these instruments was to determine the effects of a virtual classroom project on grade 7 learners' skill and knowledge of the Internet (Web-supported learning).

The research sub-questions stated in chapter one are revisited in the following paragraphs:

- *How did the learners experience interaction between themselves and the teacher, and among the learners themselves?*

- *How did the learners experience the level of secureness at intermediate phase?*
- *How did the learners and teacher experience the Web-supported learning, as compared to face-to-face teaching?*

The findings of this study suggest that grade 7 learners moderately improved their knowledge of WBI, especially when sending and receiving an email. This was evident from the small percentage increase in their knowledge of Web fundamentals. This became evident in chapter five when the learners' average score increased from 69% in the pre-test to 96% in the post-test. The learners' performance in sending email increased by 27%. The performance seems maximal if one takes into account the 26 weeks of WBI-simulated e-mail received by grade 7 learners. The findings of learners' perception of meaningful interaction suggest a similar trend.

Learners slightly improved their ability to interact in a virtual classroom by sending e-mail to each another and to the teacher, and introducing themselves in the communication forum. Although the interaction among the learners wasn't regular enough with regard to the project, the learners enjoyed sending messages to their teacher via an e-mail message. There was more interaction between the teacher and the learners - a tremendous improvement

This study suggests that learners entered the project lesson with different attitudes towards a virtual classroom. Some were motivated to learn while others were fearful and anxious of a virtual classroom. The expectation from the researcher was that of most other novice Internet users.

The results gathered from observation periods, questionnaires and interviews suggest that learners did not feel secure to explore the virtual classroom on their own. The findings suggest that the project lesson reinforced positive

feelings, and decreased negative feeling towards a virtual classroom. The following results were found for each attitude subscale in secureness:

- **Anxiety** - learners were nervous and anxious about a virtual classroom. There was a gradual decrease in anxiety as learners gained more hands-on experience.
- **Confidence** - a slight increase in confidence correlated with an increase in hands-on experience in a virtual classroom.
- **Dependency** – this remained high from the initial stage of the project lesson to its completion. Learners at intermediate phase were not yet ready to explore and to make mistakes.
- **Usefulness** - learners' attitude toward usefulness in a virtual classroom influenced interaction and secureness throughout.

The experience of secureness in Web-supported learning at intermediate phase increased with more practice and participation in WBI.

The study reports on the comparison of a virtual classroom approach and conventional teaching, as indicated below. The elements that a made difference between the two approaches are described when:

- learners were motivated and attracted by the animation of text and graphics on the screen;
- positive comments were made with regard visualisation and animation of graphics as a means of retention and understanding of the content;
- when learners admired a virtual classroom more than conventional teaching, even though they were concerned about the workload, because of the amount of information available on the Internet;
- the learners felt that a virtual classroom promotes self-discipline in comparison to face-to-face teaching;
- a virtual classroom allows flexibility, as one can work at one's own pace.

### **6.3 LIMITATIONS OF THE STUDY**

One of the limitations of this study is its case study design. As in most case studies, the research results cannot be generalised to other situations. The case study was a single event that concentrated on one particular institution. Although the results of this research cannot be generalised to similar situations, they have certain implications for similar situations typified in this study.

A proposed virtual classroom approach has not been implemented in a similar situation and has thus not been verified or researched. The learners were aware that they did not have experience of a virtual classroom and, being part of first-time implementation, they were highly motivated and participated fully.

During the initial stage of the project lesson, learners encountered technical problems when e-mail addresses did not function as planned.

### **6.4 RECOMMENDATIONS FOR FURTHER RESEARCH**

Recommendations for further research derived from observed shortcomings in the literature and field study:

- The success or failure of a virtual classroom would rest with the teacher. The most important factor would be the enthusiasm of the teacher. The preparation of the work would have to be done and tested in advance.
- Preparation should start at least 6 months before implementation. Instructions must not be complicated and should aim at the age group.

- A step-by-step introduction of Internet related terminology should be provided to attain mastery of a virtual classroom terminology at intermediate phase.
- It appears that the younger the class, the more animation is necessary in the presentation. However, if the class is computer illiterate or does not have ample opportunity to practice on the computer, no matter the age, screen print all the information, so that they can see how it should look as they work on their own. This will improve with time.
- Little information about human-computer interaction was found in the literature as it relates to WBI. One of the most crucial points in teaching in general, is how to cater for learners who have different entry levels in terms of knowledge and skills. It seems as if adaptive hypermedia would be the answer in Web-supported learning.
- Access to the Internet (Intranet-simulated) became an important factor in the implementation of Web-based Instruction (virtual classroom). Research in this field could aim at identifying strategic points in a South African context.

## **6.5 FINAL WORD**

The introduction of WBI (virtual classroom) to grade 7 learners was a learning experience. The implementation of a virtual classroom at St. Conrad's College has many implications for the learners, as it has introduced them to a new approach of WBI in the South African context. The teachers and learners were excited and positive about the manner in which the virtual classroom was implemented. It was a real challenge to the learners.

Their experience with a virtual classroom qualifies them to enter global communication, and search for information to enhance their knowledge and skills in WBI.

From the discussion above, is clear that further research is needed to ensure that WBI is implemented appropriately and correctly, based on pedagogical principles at foundation and intermediate phase, in the South African context.



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## APPENDIX A

### EVALUATION CHECKLIST FOR VIRTUAL CLASSROOM

The criterion for evaluation checklist is compiled based upon the design strategies and design principles.

<b>1. Content</b>	<b>YES</b>	<b>NO</b>	<b>N/A</b>
<ul style="list-style-type: none"><li>• Are the objectives clearly stated?</li></ul>			
<ul style="list-style-type: none"><li>• Is the quality of information good?</li></ul>			
<ul style="list-style-type: none"><li>• Is the content aimed on a specific topic or subject area, avoiding flashy elements?</li></ul>			
<ul style="list-style-type: none"><li>• Does the text and language appear, legible and simple respectively?</li></ul>			
<ul style="list-style-type: none"><li>• Is the information accurate and complete?</li></ul>			
<b>2. Screen Design</b>	<b>YES</b>	<b>NO</b>	<b>N/A</b>
<ul style="list-style-type: none"><li>• Does the appearance of ensures orderly, cleanliness and clutter free?</li></ul>			
<ul style="list-style-type: none"><li>• Is the page layout consistent throughout ensuring text and navigation elements?</li></ul>			
<ul style="list-style-type: none"><li>• Are there visual clues?</li></ul>			
<ul style="list-style-type: none"><li>• Is the screen readable and bears unique</li></ul>			

identity?			
<b>3. Text</b>	<b>YES</b>	<b>NO</b>	<b>N/A</b>
• Is the text legible enough?			
• Does the background matches the legibility of text?			
• Is the alignment appropriate?			
• Are different sizes of font avoided?			
• Is spacing correctly used?			
<b>4. Language Usage</b>	<b>YES</b>	<b>NO</b>	<b>N/A</b>
• Is the grammar correctly used?			
• Is the spelling correct?			
<b>5. Navigations and Links</b>	<b>YES</b>	<b>NO</b>	<b>N/A</b>
• Are links appropriate to all pages?			
• Are links clear and give clues to the users?			
• Do the external and internal links work?			
• Is there consistency in navigation elements to help users?			
• Is there a simple way of finding out what information available?			
• Do navigation buttons and bars remain in the same place?			
<b>6. Metaphors, Icons and Cultural Sensitivity</b>	<b>YES</b>	<b>NO</b>	<b>N/A</b>

• Are simple and direct metaphors used?			
• Do metaphors fit well with the virtual classroom?			
• Do the icons clearly represent that is intended for?			
• Is the site culturally bias?			
• Does it cater for larger variety of audience?			
• Is the site available in other languages?			

The above checklist is compiled from the resources written by the following authors: Chisholm and Van der Heiden (1999:1); Driscoll (1998:219-221); Hall (1997:34-35) and Scott (1998:1).



## APPENDIX B

### Transcript of the focus group interview (learners)

**Mr Sesemane:** “Grade 7h learners, I am very much grateful and thankful to see you attending this session. Your enthusiasm and positive attitude was noticed while participating in this project in the computer lab. The question needs your reasoning and recalling the experiences encountered. Your experience and perceptions are based on the project completed in the virtual classroom.”

**Learner A:** “I think it was challenging, because instructions were to be followed step by step. We realised that one can go back to the areas that need more attention, if one is not certain about the answer. It was a reasonably secured environment. Some worked in groups, while others worked individually. The teacher was helpful.”

**Learner B:** “It was okay, I sometimes had it difficult, but quite interesting. The virtual classroom taught one to follow instructions and do things on his/her own. I couldn't always get the teacher when a need arise, as she was busy helping other classmates. Secondly it was also frustrating for me, if I made a mistake, it took time to correct on my own, but in a face-to-face situation the teacher will always guide one.”

**Learner C:** “I agree with the previous speakers. It quite interesting and challenging because instructions are always there for one to refer from. In the normal classroom if I miss what the teacher says, I missed it. I can also go back to the other files and find different ways to do something.”

**Mr Sesemane:** “Yes, you want to explain interaction?”

**Learner F:** “I interacted with my classmates by sending them emails. I have also send the teacher an email in regard to MS Access. I like an Internet, it enables one to communicate with someone without disturbing the whole class...unlike in face-to-face situation.”

**Learner B:** “With regard interaction, I felt lonely and isolated. I even felt like expressing myself verbally. Sometimes I could not cope with the pace to complete the specific part of the project in one period. I needed encouragement, but because the teacher could not send feedback immediately, I tried one of my classmates...no response.”

**Learner E:** “Well, I must say the virtual classroom is very much supportive and useful. The reference is on hand, unlike in a normal classroom whereby I have to



go to the library for reference purposes. I can use the Internet for reference without leaving the virtual classroom. I enjoyed this session of virtual classroom, and fancy to do all my subjects via the web.”

**Learner F:** “I learnt to interact with my classmates by sending email when a need arise, especially if I encounter problems with by links or graphics moving on the screen. The communication forum motivated me to send emails to the teacher and classmates.”

**Mr Sesemane:** “What about groups?”

**Learner D:** “...it was frustrating to share or work in groups ...as it slowed the progress because we gave chance to each other.”

**Learner G:** “ Our group performed very well. We gave chance to each other, and our project looks good. We were co-operative and motivated each.”

**Learner H:** “My group did not perform well because we only gave one person a responsibility of typing. We sat at the background and watch him, and suggest only, without clicking the mouse. I think the school should see to it that the computers are in good conditions always to cover everybody.”

**Mr Sesemane:** “How did felt, sitting in front of the computer working from the virtual classroom?”

**Learner I:** “At first, I was scared that I would mess up the whole virtual classroom. After few days I got used to it and felt comfortable with the computer in front of me. I felt more secured when the teacher is next to me...or guiding the whole class what to do.”

**Learner J:** “I was anxious, scared to make mistakes and panic over switching to the MS Front Page 98. Sometimes I missed the links...I always reset my computer. I was confused. Mrs van Zyl helped and motivated me to go for it. Now I like it - I wish this project could last longer.”

**Learner K:** “Sir, other aspect is that, computers might substitute face-to-face teaching in the long run. Presently most of the things are computerised, and the only problem will be costs for the equipment in schools to implement virtual campus. The schools will need huge budgets to cover telephone bills and Internet services...I wish to do all my subjects in a virtual classroom.”

**Mr Sesemane:** “Thank you, very much for participating and time constraints do not allow us to continue. Otherwise your contributions are noted and recorded.”

**END**

## APPENDIX C

### TEACHER'S INTERVIEW

1. What are the strengths of Web-based Instruction (virtual classroom)?

- Learners could learn at their own pace;
- The content challenged the more advanced learners as he/she was able to read the information and experiment;
- As a teacher I was able to give more help to the learners that were experience difficulties;
- Learners who had experienced difficulties were more than willing to share their knowledge with their fellow learners; and
- Learners gained confidence as the project advanced and they were willing to face the challenge.

Why?

I think this would stop teachers teaching for the middle of the road learners because they don't have time for the learners with different learning skills. Secondly, this is the teaching for the future.

2. What are the weaknesses of the course?

Teacher who is not confident in this system would fall apart. The traditional role of the teacher becomes a facilitator. A teacher could not have an authoritarian stand or position because the system would break down.

## APPENDIX D

### INTERVIEW SHEET

### GRADE 7H & 8C LEARNERS

---

1. Did you enjoy participating in the virtual classroom? Yes/No  
Why?
2. Were the instructions clear and simple to understand?  
Give reasons for your answer.
3. Which section of the project did you find challenging?  
Why?
4. How did you interact with your classmates?
5. What is your perception of a virtual classroom in regard to self-discipline?



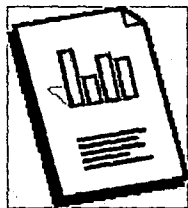
## APPENDIX E

### Some teaching pages from the virtual classroom

St. Conrad' College Grade 7h Information Technology



Project to be completed



Due Dates

#### INSTRUCTIONS

- Step One
- ⊕ Launch *Microsoft Word 97*
  - ⊕ Open the REPORT.DOC. template
  - ⊕ Discuss the contents
  - ⊕ Read the REPORT.DOC. template
  - ⊕ Look at the Grade 7 board for a teacher-generated sample
  - ⊕ Task switch to *Access*
  - ⊕ Sort the Daytime Temp field in the descending
  - ⊕ Hide the Evening Temp and Rain columns
  - ⊕ Copy the first five records
  - ⊕ Task switch to *Word*
  - ⊕ Paste the records into the report under text five highest temperatures
  - ⊕ Apply numbers to the list of cities
  - ⊕ Delete five highest temperature and enter daytime high temperatures
  - ⊕ Change the font and size
  - ⊕ Center the data in the Daytime Temp column
  - ⊕ Increase the column's width





















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Back to Top

Step Two

















-  Task switch to **Access**
-  Unhide the hidden columns
-  Sort the Evening Temp in the ascending order
-  Hide the Daytime temp and Rain fields
-  Copy the first five records
-  Task switch to **Word**
-  Paste the records under the text five lowest temperatures
-  Apply numbers to the list
-  Center the data in the Evening Temp column
-  Increase the column's width
-  Delete text and enter new text
-  Format the text
-  Task switch to **Access**
-  Unhide all of the fields
-  Sort the Rain field in descending order
-  Hide the unrelated columns
-  Copy the first five records
-  Close the database and exit **Access**



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Back to Top

Step Three

-  Paste the data
  -  Apply formatting options
  -  Replace the Field 1 heading with **City**
  -  Insert the degree symbol
- NB. Double Click on the empty square to create the following images:
-  Display the paint tools
  -  Select the ELLIPSE tool
  -  Choose yellow in the Color box
  -  Create a circle while holding down the SHIFT key
  -  Fill the circle with yellow
  -  Select the LINE tool
  -  Create orange and red sunrays
  -  Double-click the second graphics frame
  -  Select the ELLIPSE tool
  -  Choose dark blue in the Color box
  -  Make another circle that overlaps the first circle
  -  Choose the fill with colour tool, and click inside both halves of the second circle with blue

- ⊕ Leave the right second circle white
- ⊕ Select the BRUSH tool and a brush shape
- ⊕ Choose white in the Color box and create stars
- ⊕ Select another brush shape and more stars



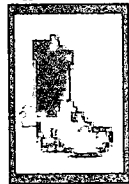
[Back to Top](#)

**Step Four**

- ⊕ Double click on the third frame
- ⊕ Choose the AIRBRUSH tool
- ⊕ Select dark gray in the Color box and a brush shape
- ⊕ Create a cloud
- ⊕ Use another brush shape to apply light gray to the cloud
- ⊕ Select MAGNIFIER tool and enlarge the view
- ⊕ Select the PENCIL tool and blue in the Color box
- ⊕ Draw a rain drop
- ⊕ Fill the raindrop
- ⊕ Return to Normal View
- ⊕ Select the raindrop
- ⊕ Copy and paste the graphic
- ⊕ Position the raindrop
- ⊕ Create 10 raindrops



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[Back to Top](#)

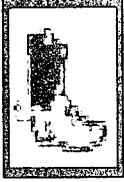
**Step Five**

- ⊕ Select the INSERT WORD.ART button
- ⊕ Enter "Weather Report"
- ⊕ Choose a WordArt shape
- ⊕ Apply a gradient fill and a 3-D effect
- ⊕ Recall inserting a footer
- ⊕ Create a footer
- ⊕ Apply a border to the footer
- ⊕ Select a line width
- ⊕ Save and preview the document
- ⊕ Close Print Preview
- ⊕ Print and close the report
- ⊕ Exit Word

 Review the lesson

 Preview the next lesson

**NB.** Do not forget to save your project and send an attachment to the instructor

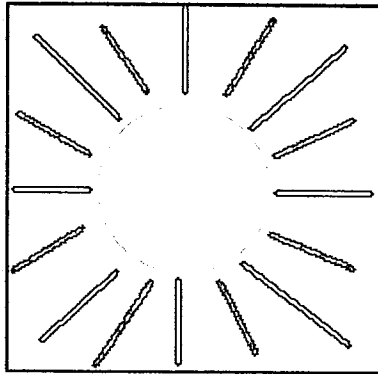


[Back to Top](#)



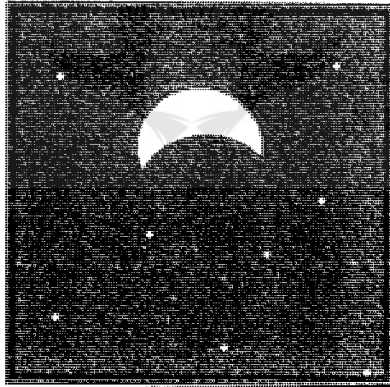
# WINDY WEATHER

## SNAPSHOT OF THE PROJECT POSTED



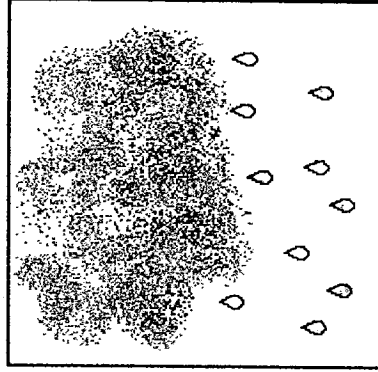
Daytime high temperatures :

City	Daytime Temp (C)
1. Yorkshi	35°
2. Winaba	28°
3. Waylam	23°
4. Telabo	34°
5. Satoma	33°



Evening low temperatures:

City	Evening Temp (C)
1. Waylam	13°
2. Abiyo	14°
3. Faranton	15°
4. Gallanto	16°
5. Palidar	16°



five highest amounts of rain:

City	Rain (cm)
1. Penam	0.43
2. Kaiume	0.38
3. Winaba	0.36
4. Bivaba	0.31
5. Kikali	0.28