Issues to consider during the content development and construction of a primary school web site

A dissertation

By

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VOORWOORD

Hierdie navorsingsprojek vorm een deel van 'n intensiewe studie rakende die ontwikkeling, ontwerp en bemarking van Web werwe vir Primêre skole, gefokus op die bou van 'n Web werf vir Laerskool Lynnwood, Pretoria. Waar my mede-navorser, Me Hendrihette du Preez se verhandeling fokus op die bemarkings en promosie aspekte, skenk ek aandag aan die inhoudsontwikkeling en –bestuur (in Engels die 'Information Design') aspekte. Aangesien 'n groot deel van die studie handel oor die spesifieke ontwikkeling van die produk, is daar noodgedwonge materiaal wat ooreenstem of oorvleuel (veral in hoofstuk 3). Die onderskeidelike verhandelinge is egter slegs aanvullend tot mekaar en kan elkeen as onafhanklike entiteit beskou word.

Belangrike terme:

Web ontwerp, informasie, inhoudsontwikkeling, inhoudsbestuur, informasie ontwerp, konstruksie van Web blaaie, Primêre Skool Web tuistes, aanbieding van informasie op die WWW.

PREFACE

This research project is one part of an intensive study concerning the development, design and marketing of Primary School Web sites, focussing on the construction of a Web site for Laerskool Lynnwood, Pretoria. The dissertation of my fellow-researcher, Ms Hendrihette du Preez focuses on the marketing and promotional aspects, where as my dissertation discusses content development, content management and Information design aspects. Due to the fact that a large part of the complete study consists of the specific development of the product, some parts of the two dissertations are necessarily similar or overlap in some instances (especially in chapter 3). However each dissertation can function as an independent entity that is supportive and complementary to the other.

Keywords:

Web design, information, content development, content management, Information design, construction of Web sites, Primary School Web sites, presentation of information on the WWW

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- My Skepper, drie-enige God en Vader
- My wonderlike ma, susters en hul gesinne (vir elke minuut se kinderoppas, kosmaak en algemene onderskraging)
- My geduldige wederhelf (vir die vertroue, raas en veral die laaste 2 maande se opofferings)
- My verwaarloosde meisiekinders (wat dalk eendag sal verstaan)
- My dierbare skoonouers (vir begrip, kinderoppas en onderskraging)
- My liewe neef (vir die gebruik van sy rekenaar)
- My dierbare vriendin en mede-navorser (vir ALLES)
- My professor en mentor Johannes Cronje (vir elke 'nice')
- Douwlien van der Merwe (sy weet goed waarvoor!)
- Laerskool Lynnwood se personeel en leerlinge
- Anneke van Rooyen

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CHAPTER 1

1 OVERVIEW

1.1 INTRODUCTION

In this dissertation the researcher reports on investigation into the content management and construction of an effective and successful interactive Web site for a Primary School located in Lynnwood, a suburb of Pretoria, South Africa. According to Vaughan (1998:2) "a revolution is taking place today in the way humans access, learn, and interact with information". It is my opinion that having a presence in cyberspace today is rather the rule than the exception, but to ensure that this presence serves a definite purpose or reaches a specific goal is where the real art lies.

At the heart of a Web site lies its content, the *information* that will attract or repel visitors. Palmer & Weaver (1998:1) states that *information* is "anything which is meaningful and useful to the person receiving it. It follows that if it is not meaningful and useful, then it is not information".

During this study my fellow researcher and I investigated and tested what the content of a Web site for this Primary School could and should be and how the site should be constructed to ensure that it is indeed a place to find meaningful and useful data. My fellow researcher investigated all aspects from a marketing and promotional perspective (Du Preez, 2001), where my study concentrates on the Information Design aspects that play an important role in Web design.

1.2 BACKGROUND

Following worldwide trends to 'put our school on the Web', schools are racing to develop sites for themselves. Is this complicated task really approached with the necessary consideration, or are they all just cooking up some kind of presence to keep up with the trend? Vaughan (1998:28) warns that WWW addresses are like real people's addresses – they are not guaranteed to be permanent, but disappear when the house burns down or floats away in a flood.

Floods and fires, however, are not the culprits that can make WWW addresses disappear. A site that does not live up to its users' expectations could soon vanish into the mist of the electronic super-highway – as has indeed happened to some sights visited during the course of this research.

According to Miller (1999) the words **Web design** make people think of "whirling icons, nondithering colors, and eye-catching type treatments: the visual elements of a Web site", they might not think of the internal structure that supports these elements. He comments, "This framework, the underlying information architecture is just as important as what sits on top. After all, if visitors to your site can't find the information they need, you might as well kiss those spinning 3D graphics good-bye". Insufficient information design might indeed be the reason why other primary school Web sites are there the one day and gone the next.

As the Information Designer of Laerskool Lynnwood's Web site, the author aided the school in selecting, organizing and presenting the content of the Web site in the most meaningful format for their particular audience. In order to accomplish this, I investigated the content of Primary School Web sites; focusing on the effectiveness of Laerskool Lynnwood's site within the day-to-day management of the school as well as the site's popularity within the immediate community.

In the course of the research the following key figures played an important role:

- Laerskool Lynnwood - including the staff, Governing Body, pupils and other stakeholders
- The professional Web designer and developer of the Web site, Anneke van Rooyen
- The researcher of this project and fellow researcher H du Preez (completing a second leg of this study, as mentioned in the abstract)

These people worked very closely together in order to design an acceptable Web site for the school, while at the same time using it as a basis for a scientific research project.

1.3 DEFINITION OF RESEARCH PROBLEM AND QUESTIONS

1.3.1 Research problem

The research problem that initiated this study is:

To determine what the content of an effective Web site for Laerskool Lynnwood should be and how the site should be constructed to ensure maximum effectiveness for all parties concerned.

1.3.2 Sub-questions

In-depth consideration of above-mentioned problem lead to the formulation of the sub-questions as listed in table 1.1.

Table 1.1 Research questions

Topic addressed	Questions	Discussed in
Development	• What is done during the planning phase of the development of a web site?	• Chapter 2
	• What is done during the content development phase of constructing a Web site?	• Chapter 2
	• Which design principles must be implemented to ensure an effective site?	• Chapter 2
	• What role does programming issues play in the construction of Web sites?	• Chapter 2
	• How does one go about Marketing and Promoting Web site?	• Chapter 2
	• How should a Web site be maintained to ensure maximum effectiveness?	• Chapter 2
Content	• What is the content of existing Primary School Web sites?	• Chapter 3
	• Who is the audience of Laerskool Lynnwood's Web site?	• Chapter 3
	• Why does the school want a Web site?	• Chapter 3
	• What information does the school want to put on their Web site?	• Chapter 3
	• What information would the audience want to find on the school's Web site?	• Chapter 5
	• How should the information be presented to ensure maximum effectiveness?	• Chapter 2, 3 & 5

1.3.3 Limitations

The following aspects limited the development and research processes:

- The research was largely dependant on limited information regarding the content of existing Primary School Web sites.
- Questionnaires and interviews are time-consuming and subjects are not always willing to participate.
- When they are "in the spotlight" people do not always answer truthfully, which could influence results.
- Making use of the Internet automatically narrows down the subjects.

- The person who physically constructed the site and the host of the site supplied their services to the school without expecting any payment. Their availability and flexibility therefore limited the researcher.

1.4 LITERATURE SURVEY

Literature appropriate for the research included:

- Information on the content and construction of Web sites.
- Research material on Web design and multimedia.
- Existing Web sites of local and international Primary Schools.
- Information on research methodology.

1.5 VALUE OF THE RESEARCH

This research serves as scientific feedback for Laerskool Lynnwood regarding the effectiveness, usefulness and possible application areas of their own Web site. It will hopefully ensure that the Lynnies site is used to its full potential and does not become another redundant skeleton of the superhighway which is there one day but gone the next. This research is intended to ensure that the Web site will satisfy the needs of the school, Governing Body, parents, pupils as well as an external audience. Last mentioned could include intended pupils and parents, prospective staff members as well as general visitors (for example teachers or pupils from other – international – schools).

The research could also give valuable information to other schools planning to enter the world of the World Wide Web by constructing a Web site, saving them the hassles of trial and error based methodology. The data collection instruments designed for this study could be generalised and applied in other ways, as discussed in the last chapter. The literature survey summarises the

opinions of experts in the field of Web design and can serve as an introductory guide for anyone interested in Information Design or Web design in general.

1.6 EVALUATION PROCEDURE

To explain the evaluation procedure followed during this research project, a few key aspects are discussed:

1.6.1 Type of research

The type of research used in this study, centres around the following methodologies:

- Literature review.
- Descriptive case study.
- Quantitative and qualitative evaluation.
- Formative and summative evaluation.

1.6.2 Subjects

The subjects for this study include:

- Users of the Laerskool Lynnwood Web site.
- World Wide Web experts.

1.6.3 Research timetable

The activities and completion dates for this research project are summarised in the following table.

Table 1.2 Research timetable

Activities	Dates
Needs analysis and overview	21 March 2000
Literature review and questionnaires	21 April 2000
Design, development and implementation	21 July 2000
Evaluation	21 August 2000
Findings and recommendations	21 July 2001
D-date	31 August 2001

1.6.4 Data collection methods

The following data collection methods were used to collect the necessary information:

- Personal interviews: The interviews were initially used to find out what the concerned parties would like to put on the Web site and later to test opinions regarding the prototype of the Web site.
- Questionnaires: Fill-in, multiple-choice and open-ended questions were used to evaluate the published Web site.
- Expert interface rating forms (EIR forms): The rating forms were used to evaluate the published Web site as well as other Primary School Web sites.
- Literature review: Covering expert opinions published in relevant journal articles, books and electronic documents available on the Internet.

- Research diary: The diary was kept to record the progress of the development of the Web site and other research aspects.

1.6.5 Data collection matrix

The following matrix shows which methods were used to answer each separate research question:

Table 1.3 Data collection matrix

Question	Personal Interviews	Question-naires	Literature Review	EIR forms	Research diary
• What is done during the planning phase of the development of a web site?			X		
• What is done during the content development phase of constructing a Web site?			X		
• Which design principles must be implemented to ensure an effective site?	X	X	X	X	
• What role does programming issues play in the construction of Web sites?			X		
• How does one go about Marketing and Promoting a Primary School Web site?		X	X		
• How should a Web site be maintained to ensure maximum effectiveness?	X	X	X		X
• What is the content of existing Primary School Web sites?				X	X
• Who is the audience of Laerskool Lynnwood's Web site?	X	X		X	X
• Why does the school want a Web site?	X				X
• What information does the school want to put on their Web site?	X				X
• What information would the audience want to find on the school's Web site?	X	X			X
• How should the information be presented to ensure maximum effectiveness?	X	X	X	X	X

1.7 OUTPUT

The physical outcomes of this study are the multimedia product and the dissertation summarising the course of the research process.

1.7.1 Description of the product

The product developed during this research process is an effective, successful Web site for Laerskool Lynnwood, rendering an interactive information service to the school, parents and pupils. In other words the developers aimed for a well-balanced site that gives credit to the school and all stakeholders while supplying meaningful and useful information to all visitors.

1.7.2 Overview of the research project report

The following table gives a short overview of the report written on the research project:

Table 1.4 Overview of the research project report

Chapter	Heading	Synopsis
1	Overview	In this chapter the researcher gives an overview of the research project.
2	Literature survey	In this chapter the researcher reports on investigation done regarding the opinions of several experts on aspects of Web design.
3	Development	In this chapter the researcher discusses the stages in the development of Laerskool Lynnwood's Web site.
4	Evaluation procedure	In this chapter the researcher reports on the summative evaluation procedure used to evaluate the Web site as published on the World Wide Web.
5	Research findings	In this chapter the researcher lists the results of the summative evaluation process.
6	In conclusion	In this chapter the researcher lists conclusions, suggestions and recommendations regarding the research project.

CHAPTER 2

2 LITERATURE SURVEY

2.1 INTRODUCTION

In solving the main research problem –

To determine what the content of an effective Web site for a primary school should be and how the site should be constructed to ensure maximum effectiveness for all parties concerned.

This chapter investigates the opinion of several writers on the following concerns:

Table 2.1 Research questions discussed in Chapter 2

Topic addressed	Questions
Development	• What is done during the planning phase of the development of a web site? • What is done during the content development phase of constructing a Web site? • Which design principles must be implemented to ensure an effective site? • What role does programming issues play in the construction of Web sites? • How does one go about Marketing and Promoting a Primary School Web site? • How should a Web site be maintained to ensure maximum effectiveness?
Content	• How should the information be presented to ensure maximum effectiveness?

2.2 THE CONSTRUCTION OF AN EFFECTIVE WEBSITE

According to Michael Lerner Productions (1999), there are six basic stages in developing an effective website:

- Planning
- Content development
- Design
- Programming
- Marketing and promotion
- Maintenance

For the purpose of this specific project, the focus is mainly on the first three stages, with only a brief discussion of the other three stages. The reason for this being that building the Web site of Laerskool Lynnwood was a combined effort by the parties as mentioned in chapter 1, and I fulfilled the task of Information Designer or Information Architect, as Sadtler *et al.* (2000:147) refers to it.

According to them, an information architecture needs to be developed that defines what data needs to be accessed and how. "Its focus is on improving the clarity and functionality of a Web site or Web application. It is not just concerned with the design of the user interface. The fundamental questions it addresses are in four areas, namely presentation, organization, navigation and adaptability" (Sadler *et al,* 2000:147).

Miller (1999) lists the **goals** that an Information Designer should aim to accomplish (own tabulation):

Table 2.2 Goals of an ID

(adapted from Miller, 1999)

Meetings	• Participating in all the meetings held by the client and development team.
Site audience	• Helping to identify the audience.
Site goals	• Defining the goals of the site.
Site structure	• Working closely with the visual designers and engineers to ensure that the recommended structure is clearly conveyed by the graphics and implemented with the appropriate technologies.

Withers *et al.* (2000) remark: "The core of information architecture is Web site navigation, labelling/naming schemes, and Web site structure. Information architects determine the functional and conceptual building blocks of a site. Unlike Web designers who are concerned with typeface, graphics, and other particulars of constructing an interface, information architects create organizational and navigational structures that help people access information".

2.2.1 Planning

According to Vaughan (1998:463) one should "never begin a multimedia project without first outlining its structure and content". Shiple (2000), Michael Lerner Productions (1999) and Frew (1997) stress that during the planning phase it is critical to first determine the primary **reason** you want to be on the Internet and who the **audience** is that you want to reach, as many design and content decisions depend on this.

Shiple (2000) remarks: "If you don't know what you're trying to achieve, why bother building a site?" He declares that defining a site's goals "establishes a clear, well-documented idea of what you are about to do, and it ensures that everyone is participating. Group consensus can make or break the project". Everyone in the company – or at least the most important people - should be

involved and agree on the contents and purpose of the site. For determining the site's mission and purpose Shiple (2000) lists a basic set of questions:

- What is the mission or purpose of the organization?
- What are the short- and long-term goals of the site?
- Who are the intended audiences?
- Why will people come to your site?

Shiple (2000) continues to say that once you have found the answers to these questions, they need to be filtered and turned into goals. Then you need to figure out which goals, or category of goals, are the most important by ranking them. When these goals are finally approved by the organization, the list of goals forms the basis for the designer's design document.

Shiple (2000) further motivates why it is important to identify a site's audience: "This is an invaluable step that many people fail to grasp. Many sites do not even take into consideration who will be using them. How can you design a site if you don't know who's going to be seeing it?" The following list of questions that can be useful in identifying the target population for a Web site, is compiled from Michael Lerner Productions (1999) and Frew (1997):

- Is this site for children or adults?
- Where do they access the Net from?
- How fast is their connection?
- Do they want to be informed or entertained?
- How will they view your page?
- What type of plug-inns do they have?

According to Shiple (2000) a true audience definition consists of who the users are and what their goals and objectives are. The technology they use to access the site is only a small part of the audience definition. He states: "defining beforehand the user experience you seek establishes a clear, well-

documented definition of your audience, and it helps in understanding how users will react to the site". As with the definition of the goals, one starts by making lists, categorizing if necessary, ranking them and then finalizing the main audience list. One should also identify the needs and goals of the audience. This can be done at the same time while identifying the audience or afterwards.

The process described above, correlates with Miller's (1999) "user profiles" as listed in Table 2.3 **Tools for an Information Designer** (own tabulation).

The following process as described by Shiple (2000) in turn correlates with Miller's "user scenarios" as mentioned in the same table: "Scenarios are stories. They tell the tales of users experiencing the site, and they help you and your collaborators visualize the site and its users. Scenarios are also helpful in validating the site's design once it is finished: If the scenarios match up with the actual design of the site, you did something right".

Table 2.3 Tools for an ID (adapted from Miller, 1999)

Tool	Description	Use
User profiles	Descriptions of audience segments, which typically include: • Assessments of visitors' technical capabilities • Visitors' locations • Visitors' degree of net savvy	Essential for deciding when to use certain technologies or how to serve audiences with varying skill levels, for example more help buttons and support for "newbies".
User scenarios	Written narratives drawn from the user profiles, describing exactly how you expect your visitors to interact with the site.	Excellent tools for figuring out how a new or complex feature will work, as they typically provide visitors' reasons for coming to the site as well as step-by-step descriptions of their paths through the site.
Content/feature lists	Lists documenting all of the site's ingredients, from text to graphics to JavaScript rollovers.	It serves as the seed from which the overall architecture will eventually grow.
Information architectures	The virtual blueprints of a site, usually presented as a set of flowcharts.	They account for all the pages in a site, explicitly detailing the parent-child hierarchy among them. Architectures often divide the site into sections by topic or purpose.
Taxonomies	Ordered systems of categories used to organize information. They can be though of as trees, beginning with major groups (the trunks) and branching into smaller, narrower groups.	They are well suited to sites with diverse types of information Yahoo and other Web directories rely heavily on them, allowing visitors to navigate up and down the branches of various search results.
Task lists	They detail all the activities available on a site.	Especially useful in developing sites that are largely utilitarian or activity oriented.
Flowcharts	Diagrams used to illustrate a site's architecture.	Similar to road maps, they show all the pages in a site, including any feedback messages (such as search results, form-acceptance thank yous, and error messages). They often undergo several revisions.
Workflow diagrams	Similar to flowcharts, but with one important distinction: rather than show all the pages, it only shows the pages along a particular user's path.	Such a diagram is especially useful for dynamically generated sites (for example, an online store or a personal banking site) where a visitor's decisions create a different and unique experience each time he/she visits.
Storyboards	They demonstrate structure and navigation. Unlike ones for CD-ROMs or TV commercials, they do not attempt to show the visual style of the interface. Storyboards for Web sites tend to be rather plain looking, using only text and simple graphic shapes (boxes, circles) to indicate buttons and picture placement.	They are good for showing how the site's structure and navigation work across pages.

Using the audience lists, you must then come up with a set of users who represent the majority of visitors, then you write a scenario for each user. Shiple (2000) says: "to get started on a scenario, you need to bring the user to life. Create a character for that user, and give him a name, a background, and a task to accomplish on the site..... Then write a story about how the character uses the site to complete the given task". According to him scenarios will be important when you are defining the content and functional requirements of the site. He also says that being creative in this process will push your design into places you may not have thought it could go – "the sky's the limit".

2.2.2 Content

"Once you have decided what you and your audience wants, it's time to prepare the content...." (Michael Lerner Productions, 1999). Writers from the Morino Institute (2000) state: "whether it's communication or information, content is the heart of a good Web site".

2.2.2.1 Information Design

The content of a web site is usually a combination of information that you currently have and information that you will have to create. "Be sure that your development objectives are consistent with the resources you have available to create and maintain a site" (Michael Lerner Productions, 1999).

Shiple (2000) says that the list of goals, the needs of the audience and an analysis of competing sites must be used to start two new lists: "one of content elements and one of the functional requirements for the site". He describes the process as follows: "Add any potential Web pages or types of content that you can think of to each list. Types of content include:

- static
- dynamic
- functional
- transactional

Copyright notices, privacy statements, and membership rules are examples of static content. Member logon pages, signup pages for email newsletters, and other pages involving forms or transactions should be included on your list of functional requirements. Browse the sites of your competition, and add any pages that are not on these two lists" (Shiple, 2000). After including ideas for content from other members of the organization, you compile what's called a "content inventory".

In the next step, Shiple (2000) says you must use the content inventory to revise your list of functional requirements. You should work with the technology and production people to determine the feasibility of each requirement. Ranking the requirements according to importance will ensure that the most important ones will survive the process. Now the content is organized into groups, named and used as the basis for defining the major sections of the site. Finally, the content inventory should be revised, if necessary, to reflect the new organization of the information.

Vaughan (1998:38) states that: "information designers structure content, determine user pathways and feedback, and select presentation media based on an awareness of the strengths of the many separate media that make up multimedia". According to Miller (1999) Information Design is, at its simplest level, built on four cornerstones, each of which also anchors a number of questions (own tabulation):

Table 2.4 The Cornerstones of ID (adapted from Miller, 1999)

Cornerstones	Questions
Organization	• How will the information be arranged? • Alphabetically, spatially, by time or topic?
Presentation	• How is the information conveyed? • With words, charts, illustrations, photographs, audio, video, or (increasingly) some combination of all of these? • Will you need one page, multiple pages, different sections, or perhaps even sub-sites with their own URL's?
Navigation	• How will visitors find what they're looking for? • How will they browse through the site? • More important, how will they know where they are?
Change	• How will the different elements of your site hold up over time? • Will the structure support the site's growth? • Will the navigation still work as well when content is added or removed?

Miller (1999) further states that good information design is fundamental in planning a site's growth. It furthermore provides the following important cues for visitors (own bulleting):

- Visitors should be able to tell what kind of information a site contains and how broad or deep it goes as soon as they arrive.
- On any page, visitors should know where they are, what they can do there, and where they can go from there.

Good information design will successfully and consistently communicate all of these messages to them.

The information in the following table is a combination of the opinions of Frew (1997), Morino Institute (2000) and Michael Lerner Productions (1999). They all support the following general guidelines for choosing content:

Table 2.5 General guidelines for choosing content

(adapted from Frew , 1997; Morino Institute, 2000 and Michael Lerner Productions, 1999)

Relevant	Make sure that the content is relevant to your organisational and institutional goals.
Compelling	Use only the most compelling information. Make sure it is useful and interesting to the people you hope to attract to your site.
Concise	Reproducing existing brochures or other documents on the Web usually doesn't work well. People have short attention spans and don't particularly like to read copious text on a computer screen.
Linked	Consider adding links to related web sites to expand information. Be sure to send courtesy notices to webmasters at the sites you link to.
Interactive	Use links and communication facilities, so that your users can interact with you. If you have the time to respond, encourage feedback via e-mail. You will get invaluable information from your audience.

After **choosing** the specific content, the designer must decide how to **organize** this information on the specific Web site in order to have the best possible effect. According to Sadtler *et al.* (2000:149) organization deals with the manner in which the information within the system needs to be organized and a good organization allows for very quick identification of where it is on the site and its retrieval, almost intuitive for the end users.

Vaughan (1998:464) says: "A multimedia project is no more than an arrangement of text, graphic, sound, and video elements (or *objects*). The way you compose these elements into interactive experiences is shaped by your purpose and messages. How you organize your material for a project will have just as great an impact on the viewer as the content itself. With the explosive growth of the World Wide Web and proliferation of millions and millions of multimedia-capable HTML documents that can be linked to millions of other similar documents in the cyberspace of the Web, your designs and inventions may actually contribute to the new media revolution: other creators may discover your work and build upon your ideas and methods".

Table 2.6 General guidelines for organizing content

(adapted from Frew, 1997; Morino Institute, 2000; Michael Lerner Productions, 1999 and Sadtler *et al.*, 2000:149)

Order	• Very carefully think through the kind of information and services you want to offer, and how the pages that present it will be organized. • Will the information be arranged alphabetically, spatially, by time or by topic? Whatever the answer, the nature of the content itself and how people will try to locate it need to be understood.
Structure	• Structured content usually consist of well-defined elements that can be easily put together by site developers. • Unstructured content usually consists of pages of information that changes day to day and needs to be scanned either manually or with relevant tools to retrieve only the relevant information.
Maintenance	• One issue with site credibility is the currency of the content. It is important to have all content owned so there are clear lines of responsibility for its maintenance. • Expiration dates that force turnover of content help ensure that content is updated.
Placement	• Not everyone has a huge monitor, so your most important elements need to be at the top of the page, where viewers will see it immediately. • People (except Japanese) read left to right and top to bottom. They almost always look at the upper-left corner first, which is a good place to put something really important.

Richmond (1999) says that the four basic steps in organizing your information are to:

- Divide it into logical units
- Establish a hierarchy of importance and generality
- Use the hierarchy to structure relationships among chunks
- Then analyse the functional and aesthetic success of your system

Presentation addresses the issues around how the information is to be conveyed, what words will be used, charts, illustrations, rich multimedia, streaming technologies and so forth. There are a number of issues that, when addressed, will help with the presentation of information:

Table 2.7 General guidelines for presenting content

(adapted from Frew, 1997; Morino Institute, 2000 and Michael Lerner Productions, 1999)

Home page	The home page should draw the audience in, not overwhelm them with information. The layout should be simple and the text brief. Add graphics to communicate your image.
Pagination	If you must include lengthy documents, break them up into sections with headings. Add headings and bold text, where appropriate, to make reading easy. Try to limit the length of a web page to three screens.
Navigation	Create an index or table of contents at the top of the page, with links to each section. If you want to provide access to a lot of documents, add a search feature or provide them as ASCII or PDF files which can be easily downloaded for reading off-line.
Graphics	Use graphics to enhance selling points, but minimize graphics file sizes whenever possible. Include only those images that add value. Not every photo needs to be in colour, not every catalogue item needs a picture, not every picture needs to be in full size.
Browsers	A layout that looks good when viewed in your favourite web browser may look different to people accessing the site from a commercial online service, such as AOL. Remember that the Internet gives you access to a global audience, many of whom are on slow Internet connections without robust telecommunications lines. Check your web page by viewing it in the appropriate browser. If your keep it really simple...- you can be reasonably sure that most people who've downloaded a browser in the past year will all see the same thing.
Text-only Mediums	Avoid graphics techniques that are inappropriate for text-only medium, such as providing text in a way that is so inextricably linked to graphic design that the information value will be lost. This will disenfranchise those users who are blind and use text-to-speech devices as well as users who are limited to text-only browsers.

2.2.2.2 Enterprise portals

Ennser *et al.* (2000:144) defines enterprise portals (EPs) as "Web-based applications that enable companies to connect internal and external users to their information systems, and provide a single gateway to personalized information needed to make business decisions. They play a key role in business-to-customer integration. Enterprise portals connect people (both customers and employee), data and applications together".

While EP applications share a common infrastructure and features, they can be divided into several categories, depending on the targeted users and the primary role of the portal (Ennser *et al.*, 2000:145).

Based on the **targeted users**, they divide portals into two categories:

- **Internal portals** are typical business-to-employee (B2E) e-business applications. They link employees to internal information resources of different kinds, like product information for sales or support, customer data, calendar of events, discussion forums, and others.

- **External portals** allow customers to access company data and applications according to their needs and company regulations, and they help in managing transactions like electronic buying, product support, help desk and others.

Based on the provided **functionality**, the categories are identified as:

- **Information portals** that organize information by subject or theme, publish news, events, product, service and company information, and so on. They rely on information and data management systems to achieve these goals.

- **Knowledge portals** are specialized information systems, that store a company's knowledge about products, services, their use and provide solutions to typical problems. They also use additional techniques than information portals, typically knowledge management tools.

- **Collaborative portals** enable teams of users to establish virtual communities to manage their work, projects and contracts. These systems use special applications for project and contact management, discussion boards, and other tasks.

- **E-commerce portals** are trading applications that establish Web-based product and service stores to allow users to browse catalogues, collect information, and buy goods over the Internet. They use product management tools, online ordering, electronic payment and other applications to create virtual storehouses of goods and services.

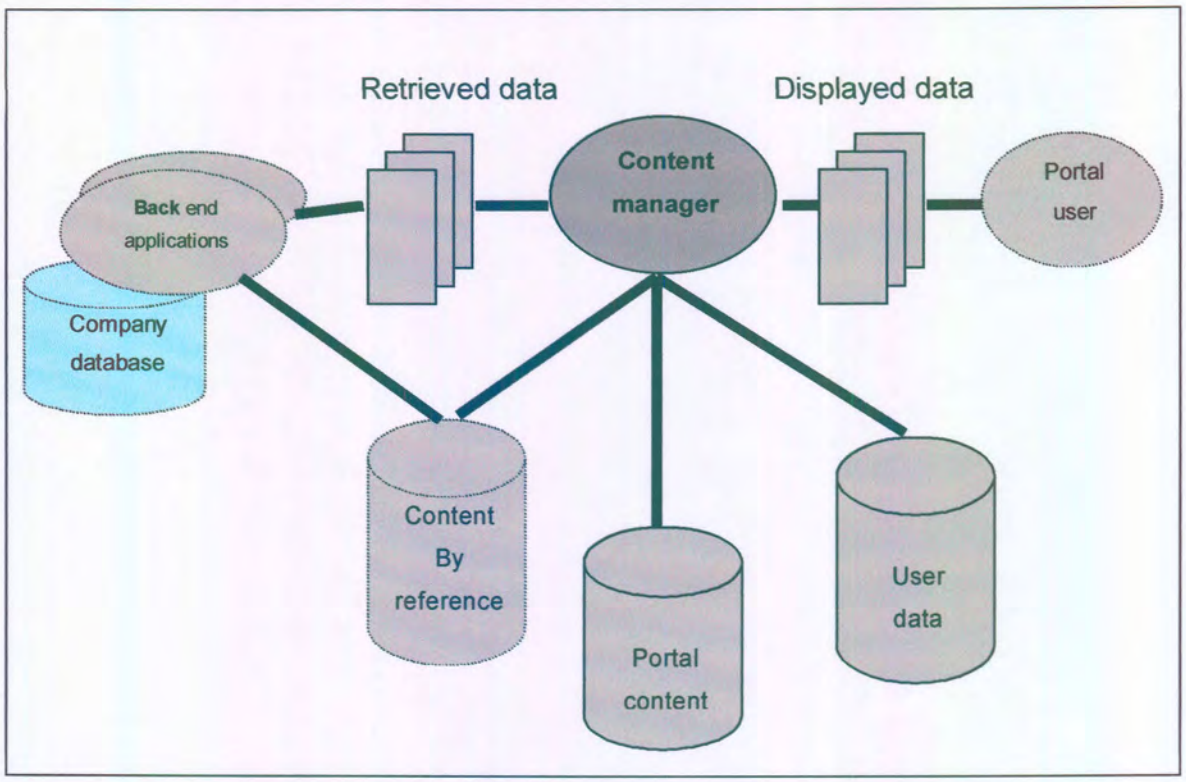
Ennser *et al.* (2000:146) concludes their discussion of EPs, commenting that "in a real world situation, it is usually hard to define the exact type of a portal, since it may provide several services from the above categories at the same time. From the customer's point of view, it is clear that the best portal integrates everything, and has a unified presentation and access. From the designers perspective, however, it is worth distinguishing between the different portal types".

2.2.2.3 Content management

While discussing enterprise portals, Ennser *et al.* (2000:148 - 149) closely examines their content management subsystems. According to them "content management takes place between a document's creation and its use in the portal by organizing unstructured data into a structured information collection that can be shared, searched, manipulated, analysed and maintained. The content of a portal can be created automatically using company information sources, or after manual data collection and document authoring. It is undoubted that the automation of these systems greatly helps portal information completeness. Content management can greatly help in keeping the enterprise portal up-to-date, enabling personalization according to user's need, and reducing human resource and time costs".

They continue to explain that content management systems perform several tasks in portals. Figure 1 shows the general architecture of a content management system.

Figure 2.1 Content management general architecture (Ennser *et al.*, 2000:149)



- **Data retrieval** from several sources is the first step in content management. On one hand, this means the automatic retrieval of data from company back end applications, converting these information into the portal's representational format, storing meta information about the retrieved data, and inserting the data into the structured portal content. On the other hand, it could also mean the manual authoring of portal content. In some cases, the content is only stored in the portal's content database as a reference to the original data (for example, product availability, price information, and similar data can be obtained directly from back end applications).

- **Document storage and management** is responsible for maintaining the portal's information repository. This includes handling metadata

information about the documents (for example, author, topics, format, source, contacts, subscription information and others). The document management system is also responsible for managing relations between documents, creating compound documents, controlling document propagation, tracking versions of documents, and performing the necessary update when source data has changed.

- **Security and access** services are responsible for maintaining information about document access rights, and controlling document access by users. This is done by identifying individual users, maintaining document access information and performing the necessary filtering on the presented documents. In simple cases, this means granting or denying access to certain documents. In more advanced systems, this can be based on the structure of the documents, and presented documents can be filtered according to the user's access rights.

- **Personalization** of content management services is a very important service in enterprise portals. It means the tailoring of the information content and presentation format according to individual user needs. The content management system is responsible for assembling the information in the way the user wants it. This is based on the recognition of the user, but it is also necessary to maintain a profile for each user (called user profile), or categories of users.

2.2.3 Design

Vaughan (1998:463) states that: "Design is thinking, choosing, making and doing. It is shaping, smoothing, reworking, polishing, testing, and editing. When you design your project, your ideas and concepts are moved one step closer to reality. Competence in the design phase is what separates amateurs from professionals in the making of multimedia".

According to Weibel (2000) "a Web site is really a bunch of HTML-based Web pages linked together by clickable hyperlinks. In that regard, a Web site is really more like a CD-ROM multimedia title than a book or magazine". He says that one should start forgetting about Web "pages" in terms of the printed page. One should think *function*: "How will you design and link the pages to give folks the easiest and clearest access to the information you intend your site to serve up".

Weibel (2000) further remarks that Web site design is a big challenge: "You're designing pages, *and* you're designing the way the pages link together. But folks won't go through the pages of your site in any particular order. Not only that, but keeping the page design consistent is a monster task because you want all pages to fit your color and graphic scheme – tough when they're spread all over. Plus, you need to see at a glance how all the pages are linked, with a map view, preferably".

In investigating the design of Web sites, the following subjects are covered:

- Site structure
- Visual design
- Navigation
- Presentation (text, images, sound)
- Aesthetics (speed, simplicity, clarity)

2.2.3.1 Site structure

Shiple (2000) says one should think of the site structure as a skeleton that holds the body together. "After creating a good site structure, everything else will fall into place. A well-designed structure makes it easy to define a navigation system, and the two together make designing page layouts and templates a snap". He then introduces a so-called "metaphor exploration"

step that "can help refine your vision of the site's structure", or can provide a rationale for the site structure. I have tabulated his three types of metaphors useful to site design:

Table 2.8 Types of metaphors (adapted from Shiple, 2000)

Types of metaphors	Explanation
Organizational metaphors	They rely on the existing structure of a group, system, or organization. For example, if you are creating a site to sell groceries, your metaphor could be a supermarket, where products are grouped logically by type.
Functional metaphors	They relate tasks you can do on the site with tasks you can do in another environment. Photoshop, a graphics program, relies on a lot of functional metaphors: You can figuratively "cut", "copy" and "paste" graphics on a computer – as though you were using real-world scissors and glue.
Visual metaphors	They are based on common graphic elements familiar to most people in our culture. If you are designing a music site that allows users to play songs, you might want to use the traditional "start", "stop", and "pause" icons found on CD players everywhere.

Richmond (1999) remarks that as the designer of a Web site, you must look at the site from the user's point of view, not just the information manager's perspective. You must identify good ways for users to structure or classify the information space. According to him, metaphor refers mainly to the mental model that users create of your site - but often it will be a reflection of your site's file structure. Metaphors are explored in brainstorming sessions, reviewed and evaluated. You can try to map out the major sections of the site by connecting elements from the content inventory to each metaphor. From this you must choose a rationale or metaphor for the site's structure. Shiple (2000) declares: "Remember, no metaphor is perfect. The overall site might not be explainable as a metaphor, but perhaps the navigation system (or smaller subsets of the site) can be".

Now that you have rationale for the site structure, you'll want to set it in stone. According to Shiple (2000) you start off by creating a text-based, hierarchical map of the site, called the "site structure listing". This list is visualized in the

form of architectural blueprints (visual representations of the site structure). "They are diagrams showing how elements of the site are grouped and how they link or relate to one another". This includes a "legend that defines how on- and off-site links, page components, pages and groups of pages are represented in the blueprints".

According to Shiple (2000) you should also "distinguish among parts of the site that are generated dynamically, and pages merely comprised of text. If your site is large, you may have to make several architectural blueprints, starting with a generalized overview of the site and working toward diagrams with a finer and finer grain".

2.2.3.2 Visual design

According to Shiple (2000) this is often the most satisfying aspect of site design. He states that: "one of its main purposes is to provide users with a sense of place. They need to know where they are on the site, where they have been, and how to get to where they want to be. A good site structure combined with an effective visual design enables users to construct a mental map of the site". He further identifies the following tools that are useful in creating the design:

- **Layout grids** that define the structure and organization of the site as it will show up on the page level.
- **Design sketches** that will establish a general look and feel.
- Layout grids and design sketches together lead to **page mock-ups**, which represent the actual site and should be as close to the actual site as possible.
- Page mock-ups are the basis for a **Web-based prototype** or, if your site is small enough, the basis for building the actual site.

2.2.3.3 Navigation

Morris (1998) declares: "navigation is one of the most critical aspects of Web site design – arguably the most important. No matter how good a site looks, and no matter how much useful information it offers, if it doesn't have a sensible navigation scheme, it will confuse visitors and chase them away. A simple, logical, understandable navigation scheme can increase your number of page impressions, boost return visits, and improve your 'conversion rate' (the number of visitors who are 'converted' into customers). It's a critical aspect of site design that has a direct effect on the bottom line".

He continues to argue that good navigation is mostly a matter of common sense and although it varies somewhat for different types of sites, there are certain basic principles that apply to almost all sites:

- Tell people exactly what is available on your site.
- Help visitors get to the parts they want quickly.
- Make it easy to request additional information.

For Shiple (2000), defining a navigation system is only one aspect of designing the site structure. The global and local navigation schemes should be documented after compilation of the architectural blueprints. He says that defining the navigation system for the site solves the following questions:

- How will users use the site?
- How will they get from one place to another?
- How do you prevent them from getting lost?

According to him the navigation system can be subdivided as follows:

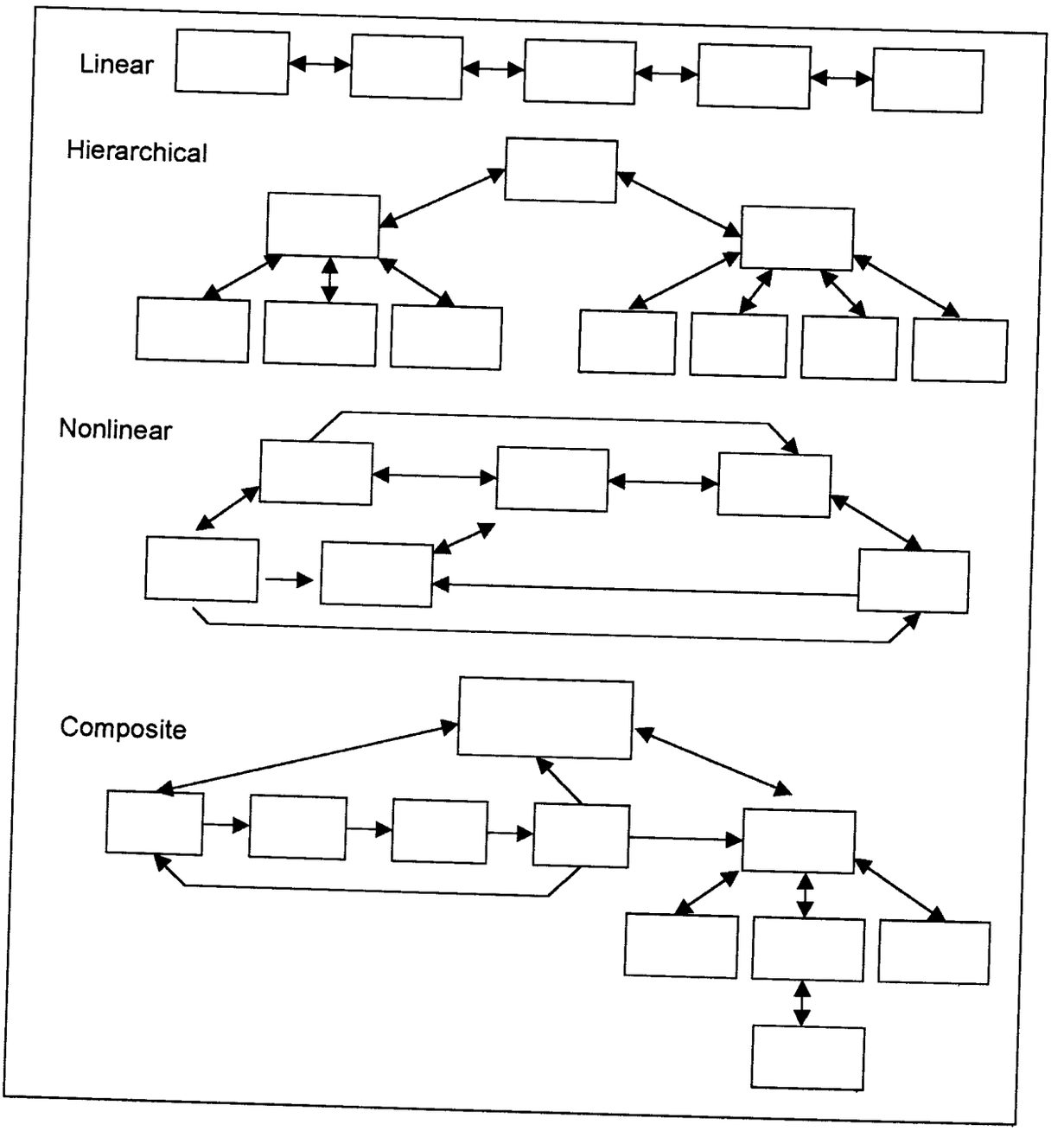
- The global navigation system, which appear on every page of the site and enables users to quickly jump between sections. It is a good idea to incorporate the branding of your site – the company logo – into the global navigation as part of the link back to the site's homepage.
- The local navigation system which can take a number of forms, such as a list of topics, a menu of choices or a list of a few related items.

According to Morris (1998) "well-designed Web sites tend to have similar navigational layouts, for the same reasons that most books have a table of contents and an index". He also stresses the importance of a good **home page** and lists the following characteristics of one that is well-designed:

- It provides an overview of what is available on the site, and every section of the site can be reached from the home page, either directly or with no more than 2 or 3 clicks.
- It looks attractive and projects the right image for the company, but it still loads in a reasonably short amount of time. A balance must be reached between whizzy graphics and fast page loading.
- It reinforces the branding of the company or product, so visitors instantly know what site they have landed on.
- It shares certain elements with all the other pages of the site, so that the pages all fit together, and visitors get a sense of the pages belonging to one site, rather than being a bunch of unrelated pages.
- It usually includes a small amount of content, even if only a brief description of the company, but its main purpose is as a list of links to other pages where the real content resides. A home page is much like the table of contents in a book or magazine.

Vaughan (1998:465) agrees with Morris and illustrates the four fundamental organizing structures used in multimedia projects, often in combination.

Figure 2.2 The four primary navigational structures used in multimedia



- **Linear:** Users navigate sequentially, from one frame or bite of information to another.
- **Hierarchical:** Users navigate along the branches of a tree structure that is shaped by the natural logic of the content.
- **Nonlinear:** Users navigate freely through the content of the project, unbound by predetermined routes.
- **Composite:** Users may navigate freely (nonlinearly), but are occasionally constrained to linear presentations of movies or critical information and/or to data that are most logically organized in a hierarchy.

According to Walker (1999) navigation all boils down to one question: "Where's the steering wheel on this thing?" He is of the opinion that the simplest early Web sites often relied on the following basic components:

- A simple link at the bottom of the page with "click here for the next page" or something similar
- In some cases a "click here for the previous page"
- A link to a clickable table of contents
- A homepage at the start of the presentation

Such layout gave Web sites much in common with printed pages, but Walker (1999) says that Web creators soon realised that they needn't mimic the straight-line characteristics of a book which is designed to be read from start to finish. Some authors then opted for "site maps", but maps load slowly, and some people just don't excel at reading maps. He is also of the opinion that Web sites don't lend themselves to being mapped.

Walker (1999) continues that "web creators then realised that any site larger than three pages or so could be split into sections, and viewers invited to choose one area, browse through it, and then pick and explore again – the model not of the book or magazine, but of a library. From that grew a new

model for page design, one where each page contained links to key pages at the start of different sections. Different corners of particular sites would be marked as library shelves are marked".

Morris (1998) says, "most sites use a hierarchical arrangement. In other words, users can 'drill down' to greater and greater levels of detail. A hierarchy may be thought of as a triangle, with the home page at the top corner, and the lowest level of detail as the bottom edge of the triangle. Hierarchies only make sense when they are reasonably close to an equilateral (equal-sided) triangle. If your home page links to twenty pages, you should add another level. If your home page links to only two pages, each of which links to only two pages, etc., then you have too many levels. Smaller sites usually need only two levels, while medium-sized sites may have a secondary level of 'hub' pages between the home page and the lower level containing the actual content. Of course, some sections of your site may have more levels than others".

"Nowadays every second professionally-designed page you visit ..... boasts a navigation bar down the left-hand side or across the top" (Walker, 1999). The page-side navigation bar almost seems to be a Web cliché today, but it works well precisely because it is so common. It automatically makes newcomers to the site feel reasonably at ease. According to Walker (1999) proper use of a navigation bar can give viewers the same sense of location that one gets from a book simply by glancing at how many pages has already been read. In that way the navigation bar is just as essential as the title page of a book.

Morris (1998) says that a "navbar" is an essential element of a well-laid-out site. "A navbar not only makes navigation easier, but is an integral part of a site's branding. When a user sees the navbar, they know what site they're on, and they know that they can get back to where they started any time, so they worry less about getting lost. Your navbar should include all the main sections of your site, and it should be the same on every page of the site (although

each section of a larger site may have its own sectional navbar in addition to the main navbar). Every page should have a navbar as an integral part of the layout of the page, which should be consistent throughout the site. Most designers put a navbar at both top and bottom of the page, although they needn't be exactly the same. A 'sidebar' is also a good place for a navbar". He heeds: "The Golden Rule of Web design applies to navbars, too: Keep it simple! Never use clever Javascript animations just because you can, but only if they actually add functionality to the user interface".

By adding buttons at the bottom of a page for 'next' and 'previous' pages, visitors may still have the option of 'reading' the site from start to finish. Walker (1999) feels that many people like this sort of straight-line exploration because most have spent years reading books. "In sites of any complexity", he continues, "the next button and the navigation bar may not be enough". Some sites also allow viewers to look at an old-fashioned table of contents. Although today's trendy sites try to do without it, he feels that Web site designers have been to eager to discard this navigation device.

Walker (1999) concludes: "Hypertext purists may complain that all these navigation devices seek to impose too much order on the chaos of the Web. And not every site needs to order its 'information' like this; some need to create mystery in order to entertain. But truth is, human minds like a certain amount of order. The Web is messy enough already. Helping people around it is a worthy goal for any site designer".

2.2.3.4 Presentation

As mentioned in paragraph 2.2.2.1, the presentation aspect of Web design revolves around how the information is to be conveyed, what words will be used, what charts, illustrations, rich multimedia or streaming technologies. For the purpose of this study **text, graphics** and **sound** are discussed.

2.2.3.4.1 Text

Cash (1999) remarks that almost every Web Page contains *some* text and that it is a good idea to have at least your basic information in text form, because some browsers only display text. Text can be composed in any text editor or word processor, as long as it is finally saved as ASCII text.

According to him text created in "a fancy word processor like Word or WordPerfect" are controllable with regards to the size. None of the fonts, attributes or formatting will survive the conversion to ASCII text, attributes and formatting are taken care of in the HTML, and the font is only controllable at the browser level.

2.2.3.4.2 Graphics

Michael Lerner Productions (1999) stresses the importance of graphics in the design process: "No matter how well-organized and interesting your content, graphics set the tone". Table 2.9 is a summary (own tabulation) of the most important things to keep in mind concerning specific design issues involved with **graphics** for the Web.

Michael Lerner Productions (1999) further states that if you want to appeal to the widest possible audience, your web pages should contain small graphic files and should steer away form the use of advanced HTML features, such as tables, which are not universally supported. They continue to say that you should keep in mind that you are designing in time as well as space, so taking your users' hardware into consideration is very important. They conclude: "Right now, the average consumer is accessing the Web at a modem speed of 28.8 kbs, although many people are at 14.4 kbs. Your site should be geared to this speed. Ideally, your file sizes should be small enough to download in 30 seconds or less. The easiest solution is to keep your site

simple and avoid those tempting "enhancements" that only some browsers support".

Table 2.9 Important tips for graphics concerning the web

(adapted from Michael Lerner Productions, 1999 and Frew, 1997)

Size	Smaller is better, that way they will download quickly.
	Keeping the file size small does not necessarily mean the graphic itself. A file with a large graphic and only a few colours can actually be smaller than a tiny graphic with many colours.
	Ideally, file sizes should be between 20 and 30K each to load almost instantly.
	A good rule of thumb is to keep the total image file size per page at 100K or less.
	To get a graphic file small enough, you have to convert it to JPEG (a compression method developed by the Joint Photographic Experts Group) or GIF (Graphics Interchange Format – a compression scheme developed by CompuServe) format.
Colour	Always design in RGB (red, green, blue) mode at 72 dpi (dots per inch) with an 8-bit maximum size.
	Colours should support your message and tell your story. A few colours can go a really long way.
	Readability depends on colour and contrast of text on background, text size, shorter line length and one word or shorter phrases make better links than entire sentences.
	White space (which need not always be **white,** but **blank**) helps the reader's eyes rest on what's important, it helps unclutter your design and focus your concept.
	For snappier looking graphics, make your images transparent. This entails changing the background colour to match that of the page so your image appears to float on the page.
General	Use techniques like indexing and dithering to fix jagged edges or gaps after reducing images to 72 pixels per inch.
	GIF is the more commonly used, probably because all web browsers have built-in support for it.
	Repeat a few design elements throughout the site to create a sense of continuity
	The best-designed web sites use graphics sparingly.

Vaughan (1998:399) states that "the majority of visitors to your Web site will be using Netscape's Navigator or Microsoft's Internet Explorer. In designing a Web site, then, you should be certain that your documents and plug-ins work and look good using those browsers".

According to Frew (1997) "the most important thing to remember when you use higher-end technologies is that you must provide a simple alternative for people who can't see them".

Michael Lerner Productions (1999) examines the possibility of providing viewing options to accommodate rather than frustrate viewers and mentions the following choices:

- Having text-only versions of your web pages
- Creating separate versions of your site, tailored to different browsers (the three most commonly used are Explorer, Navigator and AOL's browser)
- Creating two versions – a simple one without all the "enhancements" and one with "all the bells and whistles
- Writing a Common Gateway Interface (CGI) script that can evaluate the type of browser that is requesting a particular HTML file and build an appropriate version of that file on the fly

The last option is seen as more efficient and much easier to maintain, although it is complex and costly to implement. The first three will be time-consuming to develop, cumbersome to maintain and will take up valuable space on the server.

2.2.3.4.3 Sound

Vaughan (1998:242) states that: "sound is perhaps the most sensuous element of multimedia. It is meaningful 'speech' in any language, from a whisper to a scream. It can provide the listening pleasure of music, the startling accent of special effects, or the ambience of a mood-setting background. Some feel-good music powerfully fills the heart, generating emotions of love or otherwise elevating listeners closer to Heaven. How you use the power of sound can make the difference between an ordinary

multimedia presentation and a professionally spectacular one. Misuse of sound, however, can wreck your project".

Vaughan (1998:244 - 261) differentiates between three types of sounds (own bulleting):

- **Multimedia System Sounds**

  These are the system beeps and warnings available on a multimedia PC running Windows as soon as you install the operating system. In Windows, system sounds are **.WAV** files, and they reside in the Windows\Media subdirectory.

- **Musical Instrument Digital Interface (MIDI)**

  MIDI is a communications standard developed in the early 1980's for electronic musical instruments and computers. It allows music and sound synthesizers from different manufacturers to communicate with each other by sending messages along cables connected to the devices. MIDI provides a protocol for passing detailed descriptions of a musical score, such as the notes, sequences of notes, and what instrument will play these notes. MIDI data are shorthand representations of music stored in numeric form and depends on the quality of your musical instruments and the capabilities of your sound system.

- **Digital Audio**

  In contrast to MIDI data, *digital audio* data are the actual representations of sound, stored in the form of thousands of individual numbers (called samples). The digital data represent the instantaneous amplitude (or loudness) of a sound at discrete slices of time. Because it is not device dependent, digital audio sounds the same every time it is played. But that consistency comes at a price: large storage files. In general, the most important advantage of digital audio is its consistent playback quality, but this is where MIDI is the least reliable. With digital audio you can be more

confident that the audio track for your multimedia project will sound as good in the end as it did in the beginning when you created it.

For this reason, it's no surprise that digital audio is used far more frequently than MIDI data for multimedia soundtracks. There are two more compelling reasons to work with digital audio:

- A wider selection of application software and system support for digital audio is available for both the Macintosh and Windows platforms.
- The preparation and programming required for creating digital audio do not demand a knowledge of music theory; working with MIDI data usually does require a modicum of familiarity with musical scores, keyboards and notation as well as of audio production.

2.2.3.5 Aesthetics

Webmonkey Jeffrey Veen (Veen, 2000a) comments on the importance of speed, simplicity and clarity as fundamental aesthetics of web design.

2.2.3.5.1 Speed

"One of the biggest Web myths is that you can't design well without high bandwidth." Looking at the emerging design solutions to the problem of extreme bandwidth limitations, he lists some technological advances that can be used, but also sheds some light on a few simple techniques that can be used to make your pages much more manageable to your modem-based audience:

Table 2.10 Design solutions for extreme bandwidth limitations

(adapted from Veen,2000a)

Technological advances	• Cascading Stylesheets (CSS) which offer advanced typographic and layout control as a layer on top of HTML, enables designers to select type style, precise size and leading for regular text, as well as exact placement on the screen. • New vector graphics formats like Macromedia's Flash enable tiny images to scale to any size without quality degradation. • Downloadable fonts send only the characters needed for a given page.
Simple techniques	• Graphics can be designed to exploit both the characteristics of HTTP servers and the benefits of compression schemes. • Many small images combined into one will load much faster than a group of smaller, individual images. This is because every time your browser asks for another image from a Web server, the two need to communicate about the connection. This exchange slows down you browser considerably. But by grouping many small icons and images together and using an image map for navigation, you'll make your page load faster even though the file size may become larger. • Similarly, knowing when to use a JPEG versus a GIF, and how to design the images to make the most of their various compression schemes, will arm any designer with the power needed to develop blazing sites.

2.2.3.5.2 Simplicity

"**Simplicity** is, of course, the essence of good Web design.....If you want to successfully design for the Web, you will take control of your content and boil it down to its very essence. All design relies on contexts, both cultural and medium-specific ones, to communicate a message. For example, in a traditional print magazine, the reader immediately knows a bunch of things about it – how big it is, how to turn the pages, how to read the table of contents. We're only just beginning to figure out stuff like that with Web sites. Some examples include the underlined words that make your cursor turn into a hand – those are hyperlinks. Or the strip of color that runs down the left side of so many Web sites – that's part of our navigation vocabulary for now" (Veen, 2000a).

Veen (2000a) continues to say that: "In a lot of ways, these basic elements of Web design are creeping into other digital information spaces. Web-page-based metaphors for navigating information really click with people who have had limited exposure to computers. The paradigm of linked information resources is rapidly replacing the desktop metaphor. Hyperlinks, navigation bars, and search engines are taking over where folders, files, and trashcans were once the norm.

Simplicity is absolutely essential on the Web. Successful Web design takes control of content and boils its presentation down to essential elements in a subtle visual context. And when you achieve this, you'll be saying much more than you ever could through long explanations of everything on your pages".

2.2.3.5.3 Clarity

"Getting people to your pages is hard enough. But once a new reader has made it through the morass of the Web to your page, you have roughly 10 seconds to make an impression, to spark interest, and to keep the reader's cursor away from the Back button. Avoid confusion. Orient your readers with clear navigation, and they will be drawn into your site. How can you do this? One effective strategy is to carefully match words and pictures together, creating an eyeful of information that easily guides your users to where they want to go" (Veen, 2000a).

Veen (2000a) further states: "the secret to clarity in Web design is to rigorously anticipate a user's process of discovery while eloquently and succinctly placing clues to your content across your site. Show them what you've got and how to get there, then get out of the way".

The writer of Michael Lerner Productions (1999) finally recommends that the layout is tested on at least three different browsers, including one from a

commercial online service, like America Online. This will give one a good idea of how different people will see it. If you have access to different speed modems, one could try downloading the pages with 14.4, 28.8 and 33.6 connections. If you are frustrated by the experience, imagine how other users will feel.

Frew (1997) concludes: "The bottom-line is: Know your audience. You're not going to make everyone happy, but with a little effort, you can make sure a large percentage of your users see your pages the way you intended."

2.2.4 Programming

"Once you have planned your site and created the content and graphics, you will need to convert your information into a web-readable form. You can do this by converting text files to HTML and converting the graphics into GIF or JPEG format" (Michael Lerner Productions, 1999). "To deliver multimedia on the Web today, you should know some HTML - you must place the proper tags and references into your documents to launch and control your multimedia.... Many HTML editors and Web page-making applications offer to shortcut your HTML learning curves and working effort" (Vaughan, 1998:399).

"The creators of the web devised standards of communication upon which the web is built. These standards sit at a layer above operating systems, computer languages, or Internet transmission protocols and provide a basic medium for communication" (Sol, 2001). According to her, the details of HTTP are less important for an HTML designer as they are to a web programmer. The main fact that you need to grasp is that HTTP is a language spoken between your web browser and a web server so that they can communicate with each other and exchange files.

HTML (Hyper Text Markup Language) is a very simple language used to 'describe' the logical structure of a document (Sol, 2001). As Ennser *et al.* (2000:16) explains, HTML was designed to describe the presentational format of a document. Markup languages are designed to tell machines, particularly computers, how to process data. The term markup derives from early print publishers who would "mark up" text by hand to indicate to the printer which font size to use where, in which weight, using what form of alignment, and so forth. In other words, the earliest markup languages were dedicated to passing formatting instructions.

The different methods for tagging text made it hard for people to exchange data with each other. With the advent of the Internet, it became more valuable and more imperative for authors to be able to interchange documents in a format that was easy to use, yet powerful and aesthetically acceptable.

2.2.4.1 The History of HTML and XML

Ennser *et al.* (2000:16 -18) gives a brief history of HTML and its unavoidable development into the Extensible Markup Language (XML):

In 1969 an IBM team developed a document description language (the Generalized Markup Language, GML) to solve the problem of different document formats of various systems. In the following years GML developed into SGML (the Standard Generalized Markup Language), which became an international standard in 1986 for the format of text and documents. SGML is called a **meta-language**, which is a language for creating other languages.

In 1989, researchers at the CERN European Nuclear Research Facility developed a hypertext version of the SGML standard, to solve information-sharing tasks within the organization. Their leader, Tim Berners-Lee, wanted to find a language that would allow people from all over the world to create

documents that could be read by a universal client, a product more commonly called the Web browser. And from that noble idea, HTML was initiated.

"HTML inherited important features from SGML (such as being structured, implementation-independent, and descriptive), but it was also limited in many areas (it used a fixed set of element types, and it concentrated on the presentation). These limitations were necessary to make the language more simple for easy software implementation and editing.

However, the growing amount of data stored in Web systems put these limitations into focus. The World Wide Web Consortium (W3C, the organization behind the Web standards) introduced several extensions to the HTML standard to solve its interoperability and scalability problems, but finally it decided to develop a new subset of the SGML standard, XML, for Web use.

The Extensible Markup Language (XML) was developed to overcome the limitations of the HTML standard. It retains most of the features of the SGML standard, but makes it easier to implement and use in the World Wide Web environment. It became W3C standard in 1998" (Ennser *et al.*, 2000:16-18).

2.2.4.2 XML - a universal data format

Ennser *et al.* (2000:18) further explain that: "XML is practically almost indistinguishable from SGML. It has almost all of the capabilities of SGML that are widely supported by implementations, but it also lacks some important capabilities of SGML that primarily affect document creation, not document delivery. That is because XML was not designed to replace SGML in every respect, but only on the Web.

While HTML is a single markup language, designed for a particular application, XML is really a *family* of markup languages: in fact, you can define any number of markup languages in XML. This means that almost any

type of data can be easily defined in XML. So, in addition to a universal communications medium (the Internet), a universal user interface (the browser), we now have a universal data format - XML".

2.2.4.3 A short comparison of XML and HTML

According to Ennser *et al.* (2000:19) "the problem with data available in HTML format is that it is formatted for people to view, and not for computers to use. HTML consists of a pre-defined set of tags, primary for viewing purpose. This makes it a language that is easy to learn and accessible, but since it only concentrates on the presentation, it is hard to reuse the data in HTML format. This is where XML enters the picture. As its name indicates, XML is *extensible,* which means that you can define your own set of tags and make it possible for other parties (people or programs) to know and understand these tags. This makes XML more flexible than HTML. In fact, because XML tags represent the logical structure of the data, they can be interpreted and used in various ways by different applications.

Much of the value of the Web comes from re-using data. For example, one of the great success stories of the Web is that of the search engines. They work on the basis of a universal communications method (HTTP), and a universal markup language (HTML), to catalog Web pages. However, search engines work on very limited information, because only a tiny part of an HTML document is designed to be used by a search engine. Imagine how much more powerful search engines could be if the data that they search was stored in a simple, structured, re-usable format, that concentrates on describing the data, and not on the presentation.

A number of standards and specifications make XML more usable for the World Wide Web. The XML standard itself does not contain information about linking documents together, referencing to each other, using style sheets,

defining document access interfaces, and so on. The W3C is working on related specifications that make this technology more complete".

2.2.5 Marketing and promotion

There are two sides to this aspect:

- Using your specific Web site to market a product or products.
- Promoting the specific Web site to attract visitors.

2.2.5.1 Using your Web site for marketing purposes

Regarding this aspect, Fryer (1995:13) remarks: "whether you are planning a Web site to promote a record label, a retail store front, or your resume, marketing will motivate people to buy what you're selling. The Internet will add fuel to your marketing strategy because it's an inexpensive medium that anyone can tap".

Levine and Baroudi (1995:85) list the following "do's" which apparently apply to marketing tactics on the Internet:

- Keep messages short.
- Stay on the topic.
- Provide immediately useful information.
- Remember that the customer must bite first.
- Think globally.
- Learn and follow the rules of the Internet.
- Identify yourself.
- Announce your Net presence.
- Register a domain name.

- Soften the voice in your words by using the indirect approach rather than personal statements.
- Make endorsement carefully if at all.
- Respond promptly to every inquiry.
- Train your employees to use the Net.

2.2.5.2 Promoting a Web site

On the topic of promoting the specific site, Settles (2000) uses the following phrase "have a Web site, need visitors" and recommends five useful steps to accomplish this goal (own bulleting):

- Every piece of promotional materials, ads, letterhead, and even invoices should have your Web site prominently displayed with an invitation for readers to visit the site.
- Encourage visitors to your site to come back again. People who like your site enough to keep coming back will tell their friends about your area, and this in turn increases your traffic.
- Three main directories of Web sites get tens of thousands of visitors per hour who stop here to search for companies and information on the Net. They are Yahoo, EINet Galaxy and Lycos. List yourself on these directories.
- List your site on the "What's New" section of the more popular Web sites, such as GNN, NCSA, Netscape.
- Link 'till you drop. Crate hyperlinks from every conceivable site on the Web that has a high traffic of visitors who are likely to be your customer.

For Janal (2000) attracting customers to your site boils down to:

- Integrating the Internet onto overall marketing.

- Integrating the Internet onto overall marketing materials.
- Registering your Web site with the major search engines.
- Linking your Web site to complementary Web sites.

Weiler (2000) however says that marketing (or promoting) your Web site will be an ongoing effort and recommends ten steps to Web Marketing:

- Submit your Web site's URL for register with Internet Search Engines.
- Publicize with a press release.
- Obtain links from other Web sites.
- Announce in newsgroups.
- Announce in subscribed e-mail lists.
- Launch a direct e-marketing campaign.
- Produce a subscribed e-newsletter.
- Purchase ad banners on other Web sites and Search Engines.
- Create your return traffic with on-site events, surveys, contests, etc.
- Integrate your Web site's URL with your traditional marketing.

Most of the experts as listed above recommend submitting to search engines. According to Cardinale (2000) search engines are one of the most important ways people find you on the Web. To use a powerful search engine is of great importance and your site must be well "seeded" in the WWW's search engines and directories.

Wilson (2000) supplies four important aspects in preparing your web pages for optimal indexing on search engines:

- Write a descriptive title page of five to eight words for each page.
- Brainstorm with associates and list about twenty well thought through keywords that visitors would search for trying to find your site.
- Write a page description of 200 to 250 characters.
- Submit the pages to the important web search engines and directories.

2.2.6 Maintenance

Due to the inherent quality of change in our modern day society, no Web site will survive if it is not updated and maintained. In the following table I summarised some of the guidelines given to update and change content:

Table 2.11 General guidelines for updating and changing content (adapted from Frew, 1997; Morino Institute, 2000 and Michael Lerner Productions, 1999)

Update	Update your site regularly and post the date of each update.
Links	Make sure the information and links you provide are accurate and cited correctly.
	Periodically check your links to be sure they are still active.
Measure and track	Measure traffic to your site.
	Track viewers' paths through your web pages, so you can adjust your content accordingly.

According to Sadtler *et al.* (2000:151) "one of the great lessons learned in the relatively short history of the Internet is that sites need to adapt if they are to survive. User expectations of what technology can deliver and what services should be provided are constantly being raised. This raises several concerns (own bulleting).

- ***What are the measures for effectiveness?***
  Is there a clear understanding of what determines if your site is effective and how to measure the success? Are these measurements the right ones and have they been tested? How will the metrics be captured?

- ***Site evolution***

  How will your Web site cope with changes in user demand? Let us say that all of a sudden there is a surge in interest in the site. Will it be able to cope with a higher number of concurrent users? How will it cope with a change in user behaviour? What are the inhibitors to a fast effective change? This could be organizational as well as being technology based".

CHAPTER 3

3 DEVELOPMENT

3.1 INTRODUCTION

Once a company or person decides to create a presence for themselves on the Internet (as concluded in chapter 2), they have to step into a planning phase where determining the goals and the audience of the site are crucial. Once this is accomplished successfully, they can decide what information should be published. The very last but equally important step is to compile a project plan, setting out a framework for the developmental steps in the process, determining responsibility and estimating a budget for the proposed site.

In this chapter the stages in the development of Laerskool Lynnwood's Web site are discussed in detail, primarily using the model of Reeves (1994). It is however, necessary to explain that the school had decided on creating a Web site in the beginning of 1999. The developer (Mrs A van Rooyen) a parent of the school and at that time a member of the Computer Committee, offered her services free of charge to the school. However she struggled for one year to collect the necessary information to get the actual project of the ground. For this reason the school welcomed the help of the researchers with this project as well as the extra scientific research and implementation of more formal development methods that could:

- Give them reliable feedback
- Improve the actual site
- Aid in the marketing of both the school and the Web site as such

It is also necessary to point out again that this dissertation focuses on the Information Architecture of the site. All promotional aspects are discussed in detail in Du Preez (2001) and the development/programming was the responsibility of Mrs A van Rooyen. Some marketing and developmental aspects are noted or discussed in this chapter for the sake of continuity.

The following five stages in developing a multimedia project form the foundation of the development process for this Web site (Vaughan, 1998:430, Reeves, 1994 and Alessi & Trollip, 1991:245):

- Analysis
- Design
- Development
- Implementation
- Evaluation

3.2 STAGES IN THE DEVELOPMENT PROCESS

The first four stages in the development process as stated above are each summarised in a table. These tables necessarily have a strong correlation with, and are in some aspects identical to, those found in the dissertation of Du Preez (2001:55 - 60).

In Table 3.1 the activities/tools used in each **analysis phase** are listed. The results will be discussed in detail in paragraph 3.3.

Table 3.1 Stage 1: Analysis Φ

Phases	Activities/Tools
Conducting : • Goal analysis	• Making use of Reeves' (1994) Goal Analysis Tool • Filtering the mission/purpose of the organisation and the short and long term goals of the site • Ranking and approving goals
• *Target group analysis*	• *User profiles* • *User scenarios*
• Task analysis	• Task lists • Flowcharts • Workflow diagrams • User scenarios
• *Media analysis*	• *Evaluation of text, graphics, sound, video, authoring tools for suitability regarding this site*
• Information analysis	• Content/feature lists • Information architectures • Taxonomies
• *Project plan*	• *Constructing an effective Project Plan as shown in paragraph 3.3.5.6*
• Promotional analysis	• Identify a target market • Identify where and how this market can be reached • Identify a message to deliver • Formulate the steps in the Promotional Plan

Table 3.2 summarises the design rationale and features of the site, focusing on the information architecture and specifically the content development aspects of the Web site. The results of this phase will be discussed in paragraph 3.4.

Table 3.2 Stage 2: Design Φ

Phases	Rationale and features
The design of	
• Objectives	• Publishing school information on the www • Giving interested parties an idea of what this school is all about • Creating a user-friendly web site • Attracting visitors and marketing the school • Creating a web site that is visually appealing • Rendering a Community Network Service • Providing a safe 'front door' to the rest of the www
• *Delivery system*	• *World Wide Web* • *CD-ROM*
• Sequencing of content	• General and specific content • Primary and secondary content • Site map for navigation
• *Design specifications*	• *Discussed in Chapter 2 with the Literature Review*
• Design evaluation instrument	• Prototype that was reviewed • Questionnaires were designed and statistically processed • Formatting of screens
• *Flowcharting*	• *Diagrams as seen in Appendix E.*

Table 3.3 summarises the development phases and methods/materials used during this process. The results are discussed in detail in paragraph 3.5.

Table 3.3 Stage 3: Development Φ

Phases	Methods/materials
• Information Architecture Blueprint	• A-4 paper sheets • 1.44/Stiffy
• *Selection of authoring tool*	• *Evaluation and relation of authoring tools, developer's skills as well as the format of new information used to update the site*
• Prototype	• Front page • Information Architecture Blueprint
• *Formative evaluation*	• *Printouts of Prototype* • *Comments from school management and staff members, the researchers and developer*

Table 3.4 summarises the tools and/or mediums used in the final implementation phases. The results are discussed in detail in paragraph 3.6.

Table 3.4 Stage 4: Implementation Φ

Phases	Tools/mediums
• Creating and publishing the initial web site	• Front page • World Wide Web
• *Implementation of promotional strategy*	• *Posters* • *Internal billboards* • *Press releases* • *Business cards* • *School stationary* • *Letterheads*

3.3 ANALYSIS STAGE

According to Cronje & Hodgkinson (2000:2) the analysis stage can also be termed a 'needs assessment' or 'front-end analysis'. The discussion of this phase is conducted in two parts:

- In the first part the ***purpose of the analysis, limitations in the research, data collection methods and instruments*** as well as the ***sampling*** are discussed.

- The results of these analyses are described in the second part under the following headings: the ***goal-, target group-, task-, media-, content-,*** and ***project analysis.***

PART ONE

3.3.1 Purpose of the Analysis

The following table (as can also be seen in Du Preez, 2001) describes the purpose of each aspect in the analysis phase:

Table 3.5 The purpose of each analysis phase Φ

Analysis Phase	Purpose
GOAL	Determining what the specific reasons for Laerskool Lynnwood's web presence are.
TARGET GROUP	Determining the audience of the proposed site.
TASK	Providing a comprehensive description of all the tasks available on a site, isolating the probable actions of visitors, identifying the conditions under which the actions will occur and determining the proposed most popular user pathways.
MEDIA	Reviewing forms of presentation media available in order to select a combination that will deliver the message most effectively.
CONTENT	Assisting in the collection and organization of information, ensuring that content is relevant, useful, concise but adequate.
PROJECT	Presenting an overview of the direction of the project, identifying tools and actions and allocating responsibility for each stage of the developmental process.

3.3.2 Limitations in the Research

The following aspects limited the research and developmental processes:

- It was difficult to gather all information needed for the content of the Web site as each staff member was responsible to supply information regarding activities organised by him/her..
- At first staff members were not sure what type of information was needed and how it should be structured.
- Due to the time lapse of one year since the project to create a Web site

for the school was initially launched, some of the original facts and information gathered were outdated or even lost.

- The research was largely dependant on limited information regarding the content of existing Primary School Web sites.
- Interviews, meetings and brainstorming sessions are time-consuming and people are not always willing or able to participate.
- When they are "in the spotlight" people do not always answer truthfully, which could influence results.
- The developer who physically constructed the site and the host of the site supplied their services free of charge to the school. The researchers were, therefore limited by their availability and flexibility.

3.3.3 Data Collection Methods and Instruments

The following matrix is a summary of the data collection methods and instruments used in the different analysis phases. Creating the matrix was a combined effort and Du Preez (2001) therefore uses it as well:

Table 3.6 Data collection methods and instruments Φ

	Data collection methods		
	Document analysis	Brainstorming sessions	Interviews
Phases			
Goal	√	√	√
Target		√	√
Task		√	√
Media		√	
Content	√	√	√
Project			√
Instruments			
Research Diary		√	√
Content lists	√	√	√

3.3.3.1 Document analysis

We (the researchers) as well as the developer, studied all information and documentation prepared at the school during the last year. Documentation included:

- The school's weekly newsletters
- The school's termly prestige publications
- Information brochure of Laerskool Lynnwood
- Proformas (see appendix D) completed by all staff members
- School Policy Document

The content lists were used, as instruments to determine what type of information will be needed for the construction of the site.

3.3.3.2 Brainstorming sessions

Meetings and brainstorming sessions were held at different times throughout the complete development process, involving combinations of different groups at each meeting or session. Groups included the school management and Governing Body, Computer Committee, Marketing Committee, staff, pupils as well as the researchers and developer. Decisions were recorded in the research diary and content lists were used to ensure all content aspects were covered in discussions.

3.3.3.4 Interviews

Before and during the actual development of the Web site, management, teaching staff as well as learners were interviewed on an informal basis to establish personal expectations regarding a Web site for the school. During the actual launch of the site on the school's Open Day, informal interviews were also used to establish the general impression of the site on the visitors in the School Computer Centre, where the site was accessed and displayed during information sessions. Instruments used to record information or to direct interviews included the research diary and content lists.

3.3.4 Sampling

Respondents used during the formative evaluation of the Web site throughout the development phase, are discussed in this part. No formal sampling methods were used. We just tried to involve as many respondents associated with the school as possible.

3.3.4.1 The pupils of Laerskool Lynnwood

During Computer Practice classes, pupils were informally interviewed on their ideas regarding a Web site for the school. They were given the opportunity to design a 'mock home page' that could be used for the school's Web site and to give their opinions on the content of a Web site for their school. Their ideas were noted and used during the more formal brainstorming sessions.

3.3.4.2 The Teaching Staff of Laerskool Lynnwood

During the planning and development phases of the Web site, staff members were asked to supply the developers with the content for the site. Each staff member submitted a short summary or description of the activities organised or planned by him/her, listing important information regarding the activity that he/she considered worthwhile publishing on the Web site. To direct their thoughts, a proforma was designed (see Appendix D), but they were told that it listed only the most basic aspects needed. They were asked to expand the topic in such a way that the activity they were responsible for could be advertised using the information they provided.

They were also asked to proof read the prototype and to add any information they felt necessary or correct any errors they could identify.

3.3.4.3 The Management of Laerskool Lynnwood

The Governing body and Computer Committee of the school decided on creating a Web site for the school at the beginning of 1999. The developer offered her services free of charge and the initial storyboards and flowcharts were drawn up. Development then stagnated at this stage as the developer had difficulties in collecting the content. As she was only a parent at the school, staff never responded on her informal requests to supply her with the necessary information. It was only when we, the researchers, got involved and confronted them with formal documentation and target dates that the basic information for the content could be collected.

The management of the school, in the form of the headmaster, governing body, computer committee and marketing committee, had to approve all aspects of the Web site and especially the final prototype before the launch on the school's Open Day.

3.3.4.4 The Parents of Laerskool Lynnwood

Some of the Parents were involved in the planning and development of the Web site from the beginning, as they were members of the governing body and other management committees. The developer and the person responsible for hosting the Web site, were also parents at the school at the time of development.

During the launch of the site on the school's Open Day, potential parents and pupils were also informally interviewed on their impression of the site.

PART TWO

3.3.5 Results

3.3.5.1 Goal Analysis

According to Richmond (1999) the scale and seriousness of your web design effort will be determined by the goals and objectives set for the site. This will in turn, impact on many of the implementation decisions. To find out what the specific reasons for Laerskool Lynnwood's web presence is, a goal analysis was done by having meetings and brainstorming sessions with the following important bodies:

- The Governing Body of the school
- The Marketing Committee of the school
- The Computer Committee of the school

The outcome of the sessions culminated in only two main goals, being:

- Establishing a platform where the school and everybody connected to the school can communicate and exchange important information in a reliable manner.
- Publishing an effective, attractive Web site that can be used as a "show case" to market the school as such.

3.3.5.2 Target group analysis

Richmond (1999) says that it is critical to match the design and implementation of your web site to the needs, expectations and capabilities of your target audience. During the school's initial discussions about creating a Web site for the school, this aspect was never explored in detail; they just accepted that the audience would be the current parents and children, as well as prospective parents.

During closer scientific inspection, using the user profiles and user scenarios, the audience was found to range much wider:

Immediate internal audience:

- Pupils of the school
- Parents
- Members of staff

External audience:

- International visitors of the Internet (for example pupils/staff/parents from other schools trying to make contact with their counterparts).
- A wider audience – stretching from the immediate community (not necessarily directly involved with the school), to friends/family of people directly involved with the school. This segment of the audience should be attracted to the site when the Community Network Service purpose of the site, as envisaged by my fellow researcher and I, becomes active.

3.3.5.3 Task Analysis

Wolmarans & Eksteen (cited in Van Dyk *et al.*, 1992:184 - 189) list the aims of a task analysis as focused on learning/training situations, but it has been adapted as follows to focus on the process of designing a Web site:

- *Providing a comprehensive description of all the tasks available on a Web site*
- *Isolating the probable actions of visitors to the Web site*
- *Identifying the conditions under which the actions will occur*
- *Determining the proposed most popular user pathways*

As this site is intended to function as an information portal, no user activities other than searching for and browsing through, information were identified. An example of a flowchart created for the site can be seen in attachment XXX. Some probable actions of visitors to the site, (also showing their proposed pathways through the site), could include:

- A parent could access the site via the **homepage**, click on the link to **publications**, then opting for the **newsletter** to read the latest information.
- A parent could access the site via the **homepage**, click on the link to the **site map**, then choose the link to the page were the latest **academic themes** for his/her child is listed.
- A pupil could access the site via the **homepage**, click on the link to **sports**, choose **athletics** and then click on the **athletics photo album** to see the latest photographs.

The *conditions* under which these actions would occur, are inherently also given in the scenarios as set out above:

- The first parent's 'condition' would be his/her need to find information as given in the weekly newsletter.

- The second parent's 'condition' would be his/her need to find information regarding the academic themes for his child's group.
- The 'condition' for the pupil would be his/her need to see the latest athletics photographs.

This was a very vast exercise for this specific Web site, but I suffice with the examples as given.

3.3.5.4 Media Analysis

The purpose of a media analysis is to review the different forms of presentation media that is available in order to select a combination that will deliver your message most effectively. At the moment the following types of media are most often used when creating Web pages:

- Text
- Graphics
- Sound
- Animation and video

In presenting the content of this Web site, it was decided to use a combination of text and graphics in the form of words, tables, charts, illustrations, photographs or other means, depending on the specific nature of certain parts of the content. For example, introducing pupils who excelled in sport events would demand photographs where as listing the names and telephone numbers of the staff, a table would be more effective. As example I inserted two screen-captures of the staff page, one showing a graphic and the second one showing a table. The third screen capture is of the athletics photo album:

Figure 3.1 Screen-capture of the Staff page showing a graphic

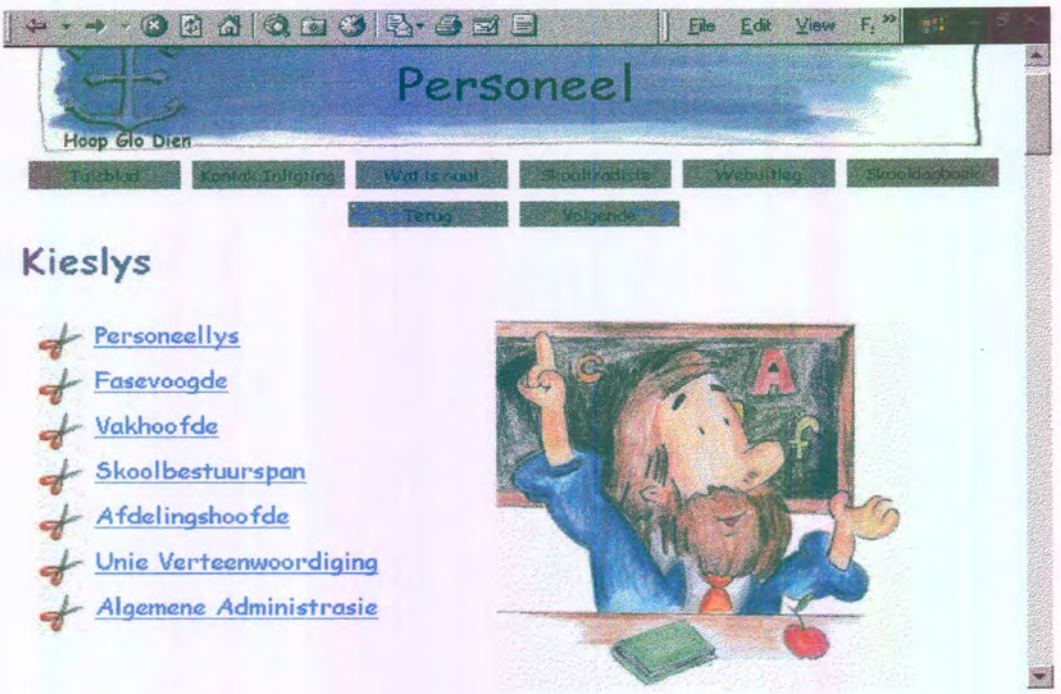
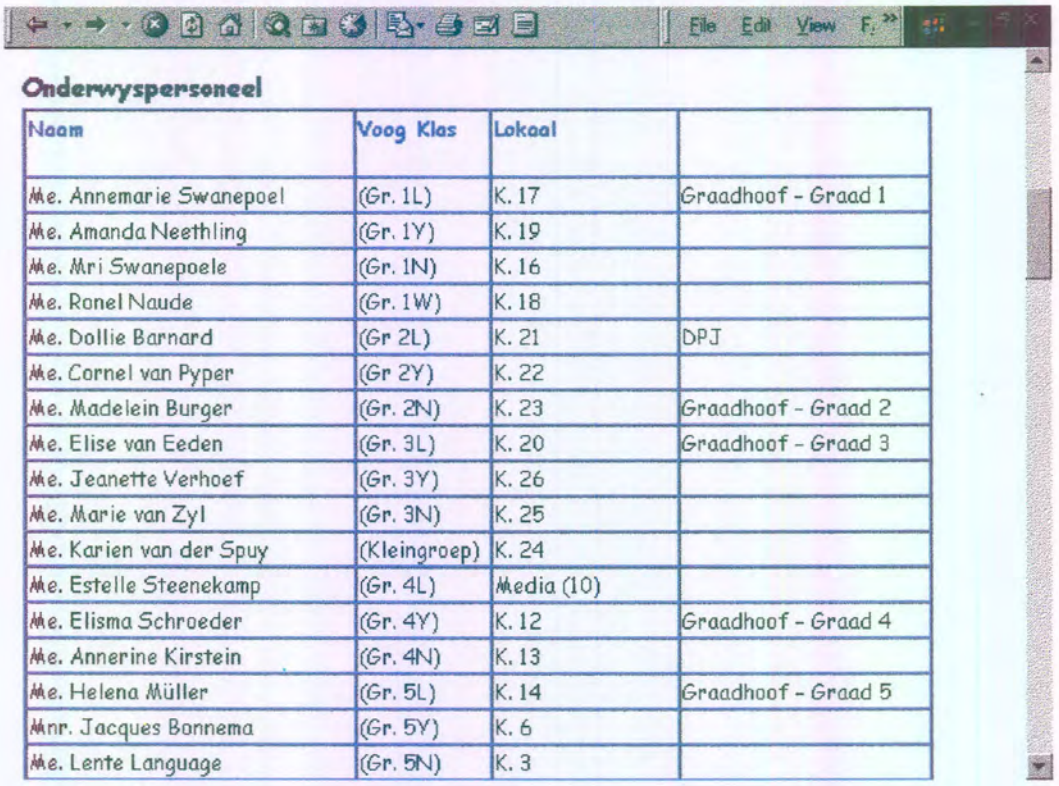
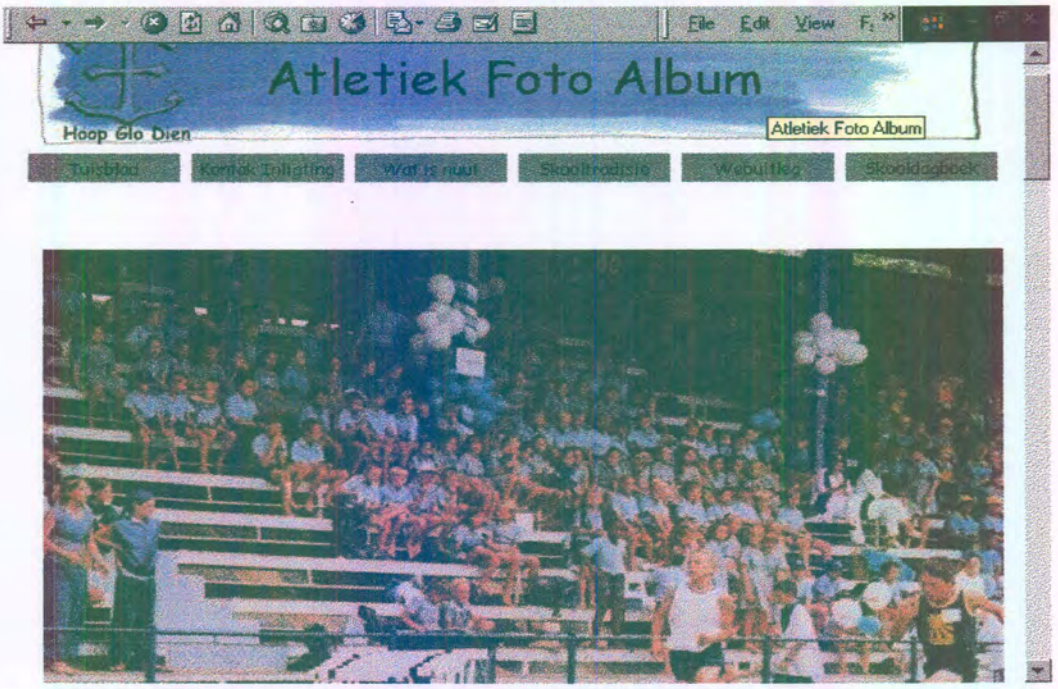


Figure 3.2 Screen capture of the Staff page showing a table



Naam	Voog Klas	Lokaal	
Me. Annemarie Swanepoel	(Gr. 1L)	K. 17	Graadhoof - Graad 1
Me. Amanda Neethling	(Gr. 1Y)	K. 19	
Me. Mri Swanepoele	(Gr. 1N)	K. 16	
Me. Ronel Naude	(Gr. 1W)	K. 18	
Me. Dollie Barnard	(Gr 2L)	K. 21	DPJ
Me. Cornel van Pyper	(Gr 2Y)	K. 22	
Me. Madelein Burger	(Gr. 2N)	K. 23	Graadhoof - Graad 2
Me. Elise van Eeden	(Gr. 3L)	K. 20	Graadhoof - Graad 3
Me. Jeanette Verhoef	(Gr. 3Y)	K. 26	
Me. Marie van Zyl	(Gr. 3N)	K. 25	
Me. Karien van der Spuy	(Kleingroep)	K. 24	
Me. Estelle Steenekamp	(Gr. 4L)	Media (10)	
Me. Elisma Schroeder	(Gr. 4Y)	K. 12	Graadhoof - Graad 4
Me. Annerine Kirstein	(Gr. 4N)	K. 13	
Me. Helena Müller	(Gr. 5L)	K. 14	Graadhoof - Graad 5
Mnr. Jacques Bonnema	(Gr. 5Y)	K. 6	
Me. Lente Language	(Gr. 5N)	K. 3	

Figure 3.3 Screen capture of the athletics photo album page showing a photograph



During the development process it was considered to bring in an element of sound by having the school's anthem played when the home page opened, but the idea was discarded for the sake of simplicity.

3.3.5.5 Information Analysis

In deciding what the specific content for Laerskool Lynnwood's Web site should be, the following three resources were used:

- The content of existing Primary School Web sites

In order to investigate this topic we (the researchers) visited and scanned as many Primary School Websites as we could find. We then randomly chose fifteen of them to use in a representative sample to determine the most popular content. Based on the knowledge gained while scanning as many

presence on each site using a table (see Appendix F for a detailed analysis). If no obvious link or associated link on a certain topic could be found on the home page of the site, it was scored as 'not present'. This research was done in July/August 2000 and does not take in account any updates or changes on these sites since then.

The researchers also did a further in-depth analysis regarding the quality of the content and the marketability of these sites using the expert interface rating form as discussed in chapter 4. A summary of this can be found in appendix G.

Table 3.7 (also used by Du Preez, 2001) simply summarises the results as to what the most popular content on existing primary schools were at the time of the study, listing them in order of least to most popular.

- Ideas offered by current staff members

Each member of the staff submitted a short summary or description of the activities that he/she organised or planned, listing important information regarding the activity he/she considered worthwhile publishing on the Web site. To direct their thoughts, I designed a proforma (see Appendix D), but told them that it contained only the most basic facts needed. I asked them to expand the topic in such a way that the activity they were responsible for, could be advertised using the information they provided.

- Ideas offered by the Governing Body, Computer and Marketing Committees

While holding the highest authority in the school, the input of these members was of great importance. Their ideas were formulated and discussed during their regular meetings and communicated to the developer and the researchers through liaison with the vice-principal.

their regular meetings and communicated to the developer and the researchers through liaison with the vice-principal.

Table 3.7 The content of Primary School Websites Φ

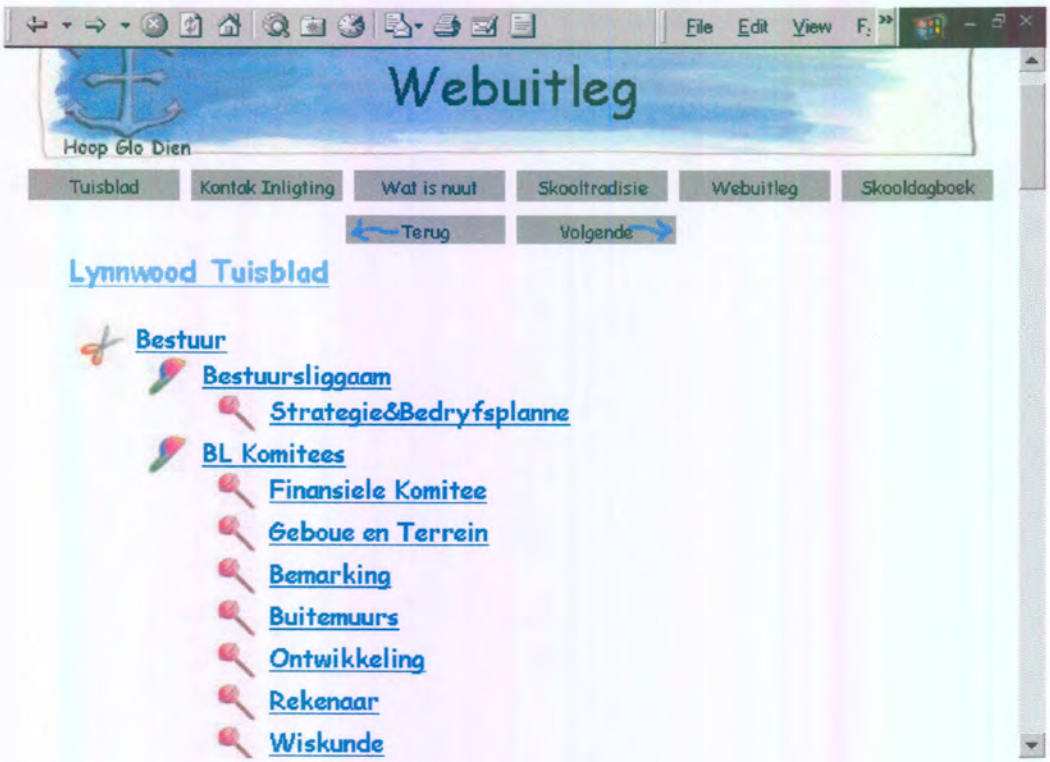
TOPIC	Frequency of occurrence on Primary School Websites
School publications	0 %
Admission requirements	7 %
After school care	7 %
School shop	7 %
School/Roadmaps	7 %
Guide for new parents	13 %
Parental involvement	13 %
Photo page	13 %
Site map	13 %
Personnel information	34 %
Prestige page	34 %
What's on at school	34 %
Year/semester plan	40 %
Current projects	47 %
Exceptional facilities	47 %
Vision/Mission/Policy	47 %
Newsletters/circulars	53 %
School history/Anthem	53 %
Advertisement/Links page	60 %
Cultural activities	60 %
Management information	60 %
Sport activities	60 %
Academic information	67 %
Contact information	100 %
General information/rules	100 %

After much deliberation, we decided that the following list of subjects, (relevant to the organisational and institutional goals), would form the core of the content for the web site:

- Management
- Publications
- Academic issues
- Sport
- Cultural activities
- The school shop (Lynnies se winkel)
- After school care
- Grade R (pre-primary phase)
- Contact information
- What is new on the site
- School tradition
- Site plan
- School diary

These topics are also used as the headings for the major sections of the site map. As can clearly be seen in the site map (figure 3.4), all these topics have further sub-divisions (also see Appendix C for the complete extended site map).

Figure 3.4: Screen capture of the Site map



3.3.5.6 Project Plan

In outlining a project plan for the content development and construction of the Web site for Laerskool Lynnwood, the most important factor to keep in mind was the fact that the school is a not-for-profit organization. As mentioned earlier, a web designer and parent of the school – Anneke van Rooyen – offered her services free of charge and another parent who is connected to an internet service provider company that is a, was able to organize free hosting, but with limited space. These factors influenced every aspect of proposed plan:

Table 3.8 Project plan ✦

Stages of Development	Tools and Activities	Responsibility of
1. Determine specific content	Goal analysis Target group analysis Content analysis Project plan	Principal, Governing Body, Developer, researchers
2. Collection of specific content	Input from staff members Content/feature lists	Developer, researchers
3. Organization of content	User scenarios Taxonomies Flowcharts	Developer, researchers
4. Compilation of prototype (not published on www yet)	Authoring tools	Developer, researchers
5. Review of prototype	Browsing through draft Print out	Principal, Governing body, staff members
6. Consult with Graphic Designer	Examples of graphics	Principal, developer, researchers
7. Review graphic designs	Specific graphics created for the school	Principal, developer, researchers
8. Integrate graphics and design outlay with existing prototype	Authoring tools	Developer
9. Update content	Authoring tools	Developer, researchers
10. Publish initial site on www		Developer
11. Implement Promotional Plan	Promotional strategy	Researchers, management, staff, parents, pupils
12. Evaluation of initial site	Interviews and questionnaires	Researchers
13. Recommendations	Findings and recommendation report for further development	Researchers

A similar project plan, focusing on the promotional aspects can be seen in Du Preez (2001:).

3.4 DESIGN

3.4.1 Objectives

The **content** objectives as defined during the planning phase and the proposed ways in which to fulfil them are listed in table 3.9:

Table 3.9 Design objectives

Objectives	Proposed ways to fulfil objectives
Publishing information regarding the school and current events on the www so that parents, pupils and staff can access it on their own time.	Publish a well-constructed, well-planned site that includes all crucial information.
Giving prospective pupils, parents and staff members an idea of what this school is all about.	Include content that portrays the spirit and achievements of the school, its pupils and personnel.
Creating a user-friendly Web site.	Creating an environment with a clear navigation system including a site map for easy access to specific items.
Ensuring that the Web site will attract pupils and parents and market the school and its successes.	Include general organisational information as well as prestige material in the site.
Creating site to be visually appealing to children and adults.	Choose a metaphor that appeals to all with original graphics and soft pastel colours.
Using the site to render a Community Network Service.	Provide information that is important to all members of the local community.
Constructing the site to provide the pupils with a safe front door to the rest of the www.	Create a 'links' page that gives access to interesting, but safe sites.

Du Preez (2001) lists the promotional objectives and proposed ways to fulfil them.

3.4.2 Delivery system

The decision made by the management of Laerskool Lynnwood to create a Web site for the school, was based on the sound knowledge that most of the target audience as set out in paragraph 3.3.5.1, has access to the Internet.

We, the researchers, decided to deliver the site by means of Compact Disc as well as publishing it on the Internet. We are also including a CD with each copy of the dissertation for the following reasons:

- It is one of the course requirements
- It will enable the study to stand independently. This can be very important for further research or referencing as it is not possible to predict whether this site will still exist in the same format or at all in future
- It will widen the probable audience of the dissertation, as having access to the WWW is not necessary.

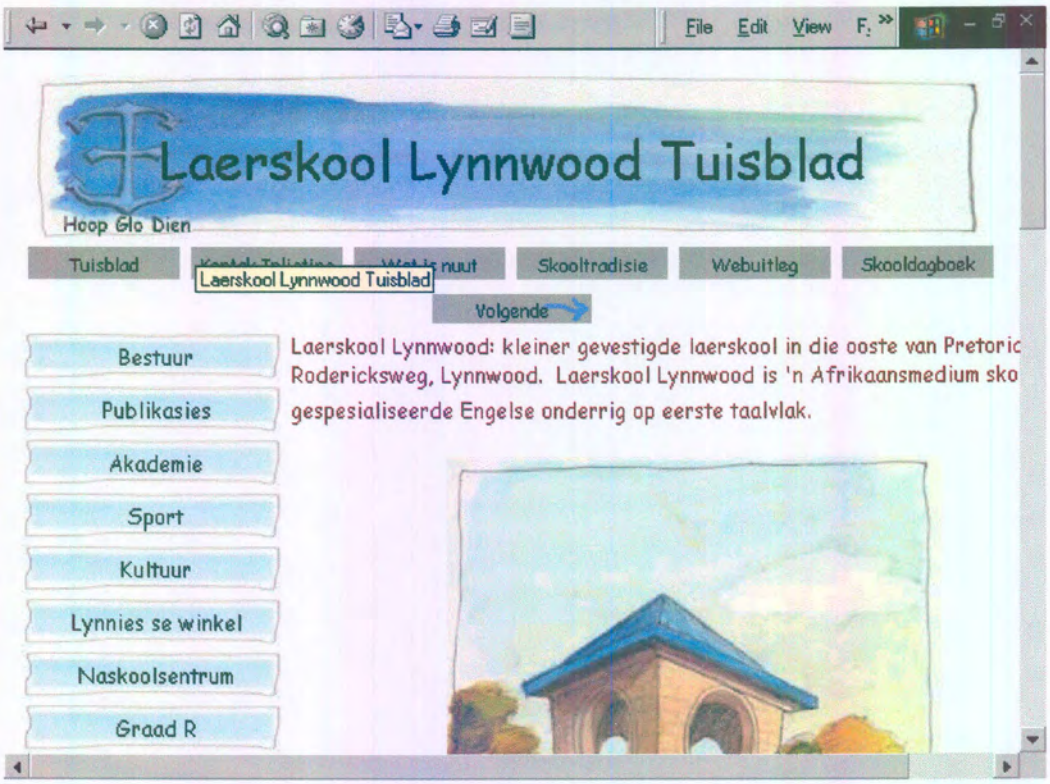
3.4.3 Sequencing of content

It was decided to keep the navigation system as simple, logical and straightforward as possible as the audience of this site is so varied. The navigational system mainly consists of the following elements:

- The site opens with a homepage illustrating the main entrance of the school with a brief description of the school and its purpose.
- A main horizontal navigation bar repeated at the top of every page of the site, gives access to the home page, contact information, what is new, school tradition, site map and school diary.
- Each page then has a vertical side navigation bar which gives access to the next level of information on that specific topic.
- A "next" and "previous" button enabling easy access to the previous or next page, but also enables users to read the site from start to finish (like a book) if so desired.
- A site map that can be accessed at any time from the main horizontal navigation bar gives a brief overview of the content and set-up of the site.

Figure 3.4 shows a screen capture of the site map and figure 3.5 illustrates the horizontal and vertical navigation bars as seen on the home page:

Figure 3.5 Screen-capture of the home page



3.4.4 Design specifications

In this section text attributes, navigational aspects, aesthetics and design principles, as seen from the perspective of the information designer, are reviewed. Each of these is discussed in table form for easy reference. Similar tables can also been found in Du Preez (2001) as viewed from a promotional perspective.

The following table is a summary of the way that text attributes are used in the Web site:

Table 3.10 Description of text attributes ✦

Text attributes	Description
Type face	The font type used is Comic Sans. This font type was chosen as it is very close to the prescribed letters when children are initially taught to write but at the same time it has a 'fun look' to it, suited to a primary institution.
Font size	Main headings are written in 16 pt. Sub-headings are in 14 pt. The rest of the content is written in either 10 pt or 12 pt. Text in the vertical and horizontal navigation bars is written in 10 pt.
Colour	Most of the text is in black, blue or purple. The background is white. Use of the different colours prevents monotony and is used to lift out the beginning of different sections within longer pages. Change of colour is also used to indicate when links have been chosen.
Type styles	The main headings are written in **bold** to draw attention and for easy readability. Links are underlined. *Italics* are used within tables to mark important facts.
Justification	Text is justified on the left margin.
Case	Sentence case is used throughout for easy readability.

In the following table design specifications regarding navigational aspects are listed:

Table 3.11 Description of navigational aspects ✦

Navigational aspects	Description
Icons/Symbols	Objects chosen include scissors and lollypops as they are known to and associated with children. All symbols/icons were chosen for their strong connotation with the character of a primary school. For this reason the 'forward' and 'back' buttons are further clarified using arrows.
Buttons	Except for the 'forward' and 'back' buttons as mentioned above, all other buttons only have text on a grey or light blue background.
Layout of content	The specific placement and order of the content is based on a hierarchy of importance and generality that was established after the general content was divided into logical units. The hierarchy was used to structure the relationships between the chunks or categories that emerged. The site map gives an overview of all available content and the way it is structured. White space is left between sub-headings with each main heading starting on a separate page. The text under each heading was boiled down to the very essential.

The following table gives a description of aesthetics and screen design principles as implemented on the Web site of Laerskool Lynnwood:

Table 3.12 Aesthetics and screen design principles ✦

Aesthetics and principles	Description
Consistency	The logo underneath the main heading as well as the horizontal navigation bar appears at the top of every page. Although the words change, the general look of the vertical navigation bar on the left stays the same throughout. The buttons, icons, symbols, graphics and general look and feel of the site was chosen to be soft and appealing and comply with the primary school metaphor. All hyperlinks are underlined and change colour when activated. The same typeface is used throughout.
Simplicity	In developing the site, it was decided to follow the guidelines of Veen (2000a) and keep it as simple as possible, especially as the site consists of more than 50 pages. The site is constructed using only a combination of text and graphics. Graphics were chosen to suit the general site metaphor and to be subtle and not overwhelming. For this reason there is not necessarily a graphic on each page. Photographs are used on special pages created for this purpose only, which also simplify maintenance. The same typeface is used throughout.
Clarity	The fact that navigation bars are the same throughout the whole site makes it easy to understand. Three options of browsing the site are given for further clarity: • Using the navigation buttons and bars to jump from one topic to another • Using the next and back buttons to read the site from beginning to end (like a book) • Using the site map to find specific subjects fast.
Balance and harmony	The designer tried to create a fine balance and harmony within the site by sequencing text, tables, photographs and specially designed graphics. Some pages have no graphics for the purpose of not using too much bandwidth and so doing slowing down the download time, but also to make the effect more subtle rather than overwhelming visitors with pictures.
Graphics and images	The graphics, designed by a professional graphic artist, was chosen to compliment the school theme while at the same time giving an unique character to the school as such. The sketch on the home page is a portrayal of the main entrance of the school and the logo used for the main heading of each page (the one I used for my own chapter headings, but without the motto) incorporates the school emblem.
Colours	The designer and graphic designer attempted to use combinations of the primary colours, but softened into pastels. The main colour, blue, as used on the site is also the main colour associated with the school.

3.4.5 Evaluation instrument

According to Trochim (1999) "formative evaluations strengthen or improve the object being evaluated, they help form it by examining the delivery of the assessment of the organisational context, personnel, procedures, inputs and so on". The researchers, developer, staff and management of the school informally evaluated the prototype and printouts of the prototype. The implementation of their recommendations together with the use of the specially designed graphics and visual site metaphor, changed the prototype into the initial site that was launched to co-incide with the school's Open Day in July 2000. This site was evaluated again more formally by the researchers using interviews, a questionnaire and expert interface ratings. The results of this summative evaluation are discussed in Chapter 5.

3.5 DEVELOPMENT

As mentioned previously, the physical development of the prototype and then the initial site that was published was the responsibility of Mrs A van Rooyen, a professional Web site developer.

3.5.1 Information Architecture Blueprint

In creating the final blueprint for the site, the developer integrated data extracted from the user profiles, user scenarios, content/feature lists, task lists, workflow diagrams and storyboards. These were presented as sets of flowcharts. An example of this can be seen in appendix E.

3.5.2 Selection of an authoring tool

Front Page was chosen as authoring tool due to the fact that the developer preferred it, but also for easy compatibility with all other Microsoft Office applications. This is a necessity as material for updating the site will be supplied by various people, who are mostly only proficient in Microsoft applications and crucial time can be saved if new information can be uploaded immediately as supplied.

3.5.2 Prototype

After agreement was reached on all proposed elements and the most crucial information was collected and structured, the web developer compiled the first prototype of the web site, using a general template in Front Page. The services of a graphic designer were at this stage only called in, as it was deemed necessary for her to see the prototype before she could design the graphics in accordance to instructions.

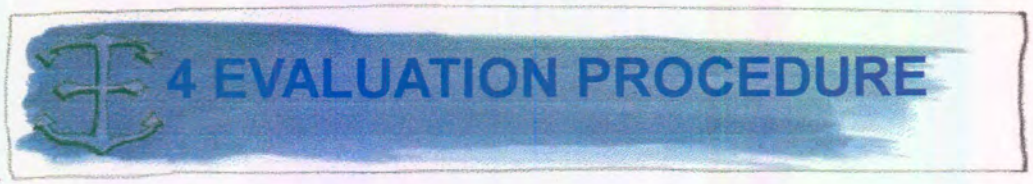
3.5.3 Formative evaluation

For initial formative evaluation, the prototype was printed out and given to the school management and staff to proof read, change misinformation or add information previously left out. We, the researchers, held informal discussion groups with the computer committee, management and developer respectively to evaluate all development and design aspects. During these meetings final changes were approved and adopted and the developer was given final instructions to create the initial site for publication on the WWW.

3.6 IMPLEMENTATION

After making all changes as discussed during the formative evaluation process, incorporating specially created graphics and implementing the visual site metaphor chosen, the developer published the initial site on the WWW. The site was formally launched during the school's Open Day in June 2000, using a Promotional Plan as set out in Du Preez (2001). The URL of the site was advertised throughout the school, a large printout of the Home page was block mounted and displayed in the hall. People visiting the school's information centre were given the opportunity to browse through the Web site. This initial site that was published on the WWW was used in the summative evaluation process as discussed in chapters 4 and 5.

CHAPTER 4



4.1 INTRODUCTION

Trochim (1999) defines evaluation as "the systematic acquisition and assessment of information to provide useful feedback about some object". According to him the generic goal of evaluation is to provide 'useful feedback'. Feedback is seen to been useful if it aids in decision-making. He further notes "perhaps the most important basic distinction in evaluation types is that between ***formative*** and ***summative*** evaluation.

Cronje & Hodgkinson (2000:41) explain the difference as follows:

- **Formative evaluation** is on-going evaluation while the development is still in progress, with the aim of constantly improving the product. The rationale is to **adapt** and improve the product.
- **Summative evaluation** is the final evaluation to determine if the program is worth implementing. The rationale is to **adopt**.

This chapter reports on the **summative evaluation procedure** that we (the researchers) followed to evaluate the Web site as first published on the World Wide Web.

4.2 RESEARCH PROBLEM AND MOTIVATION

The main problem and motivation for this evaluation is to determine what the content of an effective Web site for Laerskool Lynnwood should be and how

the site should be constructed to ensure maximum effectiveness for all parties concerned. After completion of all the necessary planning aspects, formative evaluation of the prototype with implementation of all recommended improvements, the initial Web site was published on the WWW. The motivation for this part of the study is to find out whether this initial site conforms to the requirements of the audience regarding both content and design aspects.

4.3 PURPOSE AND OBJECTIVES OF THE STUDY

The purpose of this research is to find out if the audience is satisfied with the Web site of Laerskool Lynnwood and whether it is considered to be a good site and to use this information to improve the site if possible. This purpose leads to the formulation of the following objectives:

- Promote the initial Web site among parents.
- Create a questionnaire to assess the parents' opinion of the Web site.
- Create an expert interface rating form and have experts assess the Web site.
- Write a report on the results.

4.4 RESEARCH QUESTIONS

This part of the research project, mainly centres around the following two sub-questions as listed in the original table of research questions (Table 1.1, Chapter 1):

- What information would the audience want to find on the school's Web site?
- How should the information be presented to ensure maximum effectiveness?

4.5 RESEARCH METHODOLOGY

The methodology used in this research is a descriptive, cross-sectional, summative case study, focused on impact evaluation. Most of the results of this study will be based on numerical values (quantitative), but we, (the researchers), agree with Trochim (1999) that "qualitative and quantitative data are intimately related to each other. ***All quantitative data is based upon qualitative judgements; and all qualitative*** **data** ***can be described and manipulated numerically***".

According to Trochim (1999) a study is descriptive when it is designed primarily to describe what is going on or what exists. This research is designed to describe the reactions of the parents as well as that of WWW experts to the initial Web site. Trochim (1999) also distinguishes between cross-sectional and longitudinal studies: "A *cross-sectional* study is one that takes place at a single point in time.... A *longitudinal* study is one that takes place over time". The respondents completed all data collection instruments used in this study at a single point in time (August 2000).

Trochim (1999) explains that summative evaluations "examine the effects or outcomes of some object - they summarise it by describing what happens subsequent to delivery of the program or technology; assessing whether the object can be said to have caused the outcome; determining the overall impact of the causal factor beyond only the immediate target outcomes; and estimating the relative costs associated with the object". He further explains that ***impact evaluation*** is broader than ***outcome evaluation*** because it assesses the overall or net effects (intended or unintended) of the program or technology as a whole.

4.6 LIMITATIONS

The following aspects limited the evaluation process:

- The time-lapse between the official launch of the site at the school's Open Day and the time of evaluation was less than 3 months.
- Not many respondents had visited any other Primary School Web sites and thus found comparison difficult.
- Questionnaires are time consuming and not all respondents are willing to complete them.
- When they are "in the spotlight" people do not always answer truthfully, which could influence results.

4.7 SAMPLING

Convenience or accidental sampling was used as method in this study. Korpel (1998:44) summarises the opinions of Cohen & Manion and Bailey to give the following explanation of convenience sampling:

"Convenience sampling involves choosing the nearest individuals as respondents and continuing that process until the required sample size has been obtained. Convenience sampling is adequate if the:

1. *Researcher does not want to generalise results beyond the sample;*
2. *Study is merely a trial run for a larger study; or*
3. *Investigator plans to repeat the study at a later stage and is initially more interested in perfecting the data-gathering instrument than the sample.*

Advantages of doing convenience sampling is that it:

- *Is less complicated;*

- *Is much less expensive; and*
- *May be done on a spur of the moment basis to take advantage of available respondents without the statistical complexity of a probability sample.*

Disadvantages of doing convenience sampling are that the investigator:

- *Generally cannot claim that the specific sample is representative of the larger population;*
- *Has a limited ability to generalise beyond the specific example; and*
- *Is unable to determine the sampling error".*

4.7.1 Parents of Laerskool Lynnwood

The first questionnaire, focused on the parents of the school, was handed to 90 parents. The parents were chosen according to the grade that their eldest child was in during the year 2000. Six classes were chosen from the 20 in the school, one each from grades 1 to 6. As the grade 7 pupils would only be in the school for a further 3 months, their parents were not included in the study. Fifteen questionnaires were handed out per class to the parents of the eldest or only child in the school.

4.7.2 WWW experts

The respondents in this group included 5 people who daily surf the Internet as part of their profession, and 5 students completing the final year of a Web design course. For reference purposes the people who daily surf the Internet as part of their profession, are called "Professional surfers", the final year students are called "students" and they are collectively called "the WWW experts" for the purposes of this report.

4.8 DATA COLLECTION INSTRUMENTS AND OBJECTIVES

As explained in paragraph 4.5, the instruments used in the research strategy (a case study) were a questionnaire and an expert interface rating form. Table 4.1 summarises the instruments and their separate objectives. An example of each questionnaire can be found in the appendices as indicated in the table:

Table 4.1 Data collection instruments and objectives

Instruments	Objectives	Appendices
Questionnaire focused on parents	Determining: • Computer literacy levels of parents • Ways and means of access to the internet • What content parents want on the Web site • If some parents have visited the Web site • How often the parents want the site to be updated and whether they want to be involved in the maintenance and/or development Assessing the opinions of the parents who have visited the site regarding: • Content available/not available • How the site compares to other primary school Web sites • The general impression of the site • How the site should be promoted • The design aspects	Appendix A
Expert interface rating	Assessing the opinions of experts regarding • The navigational aspects of the Web site • The layout of the Web site Comparing Laerskool Lynnwood's Web site with other Primary School Web sites	Appendix B

The questions asked in the questionnaire that focused on the parents of the school, were formulated using the initial Web site as a guide for content and

design based questions. Multiple choice, open-ended and fill-in questions were used.

The expert interface rating form focused on the WWW experts is based on a Web Course Evaluation Checklist designed by Wein *et al.* (2000). The rating form consists of two sections:

- In the first part all navigational and layout aspects listed are to be rated on a scale of one to four, where one is 'poor' and four is 'excellent'.
- In the second part respondents were asked to give comments and/or recommendations regarding the Web site.

Only the professional surfers were asked to complete both sections while evaluating Laerskool Lynnwood's Web site. The students evaluated the schools Web site using the first section only.

The researchers used the first part of this interface rating form to evaluate the sites of the same 15 schools that was used for the content analysis in chapter 3. These results were compared with those of the WWW experts regarding the Web site of Laerskool Lynnwood.

The results of this evaluation procedure, (including both instruments), are discussed in detail in chapter 5.

CHAPTER 5

5 RESEARCH FINDINGS

5.1 INTRODUCTION

In this chapter the results of the summative evaluation procedure as discussed in chapter 4 is summarised. The main object of the research done in this study centres on the following research problem as identified in chapter 1:

To determine what the content of an effective Web site for Laerskool Lynnwood should be and how the site should be constructed to ensure maximum effectiveness for all parties concerned.

In the first part of the chapter a detailed description of how each data collection instrument was designed to meet the objectives, is given. Then the actual findings are listed and discussed.

5.2 DESIGN OF DATA COLLECTION INSTRUMENTS

The description of how the questionnaire was designed as data collection instrument to meet the research objectives, is given in Table 5.1. Lengthy questions are summarised for the sake of easy-readability and indicated with a capital 's' in brackets '(S)' in the last column. For the complete question as formulated in the questionnaire, see appendix A.

Table 5.1 Research objectives and design of the questionnaire

Objective	Specific questions	Type of question
1. To determine computer literacy levels of parents	Q1: Do you use a PC in the course of your work? *Q2: Do you use a PC at home?* Q3: Do all members of your family have access to a computer at home?	Q1: Yes/No *Q2: Yes/No* Q3: Yes/No
2. To determine parents' ways and means of access to the internet	*Q4: Do you use the internet in the course of your work?* Q5: If and where do you have access to the internet? *Q6: If you do not have access to the internet, when, if at all, do you plan to get it?*	*Q4: Yes/No* Q5 (S): Multiple choice *Q6(S): Multiple choice*
3. To determine what content parents want on the web site	Q10: Would you like to visit the school's web site for one or more of the following? *Q17: Would you like to see more information regarding the history of the school on the Web site?*	Q10(S): Multiple choice *Q17: Yes/No*
4. To determine if some parents have visited the web site	*Q11: Have you visited the Web site of Laerskool Lynnwood yet?*	*Q11: Yes/No*
5. To determine how often the parents want the site to be updated and if they would like to take part in any way	Q14: How often should the school Newsletter be published on the Web site? *Q15: How often do you think the design of the site should be updated?* Q32: Would you like to be involved in the development and/or maintenance of the Web site in some way?	Q14 (S): Multiple choice *Q15 (S): Multiple choice* Q32 (S): Multiple choice
6. To determine the opinions of parents who have visited the web site regarding the content	Q18: Is the contact information regarding the school portrayed effectively on the Web site? *Q19: Do you think the school traditions are portrayed effectively on the Web page?* Q20: Could you find the necessary information in the School Diary regarding the following aspects? *Q22: Would you like to see more photographs on the Web site?* Q25: Is the content concerning the following aspects sufficient?	Q18: Yes/No *Q19: Yes/No/Unsure* Q20 (S): Multiple choice - Yes/No *Q22: Yes/No* Q25 (S): Multiple choice - Yes/No
7. To assess opinions of the parents who have visited the site regarding the general impression and design aspects	*Q23: Could you access the Web site in good time?* Q26: Do you think the Web site is user friendly? *Q27: If you answered 'no' on Q26 what is the reason?* Q29: What impressed you the most about the Web site?	*Q23: Yes/No* Q26: Yes/No *Q27 (S): Multiple choice* Q29: Multiple choice - Open ended
8. To assess the opinions of parents who have visited the site regarding how the site compares to other Primary School Web sites	*Q30: Do you regularly visit the Web sites of other primary schools?* Q31: If you answered "yes" on Q30, how does the Lynnies Web site compare to the sites of other schools?	Q30: Yes/No *Q31: Good/Bad*

Not all questions are listed in this table as Du Preez (2001) used the questionnaire as an instrument as well. The questions focussing on her research are discussed in her dissertation in chapter 5.

To create the expert interface rating form, the Web Course Evaluation Checklist designed by Wein *et al.* (2000) evaluating the purpose of evaluation Web sites, was used as model. In the first part of the rating navigational and layout aspects (as summarised in table 5.2) are listed and are to be rated on the following four-point scale:

1 = Poor 2 = Adequate 3 = Good 4 = Excellent

Table 5.2 Summary of aspects listed in expert interface rating form

The navigational aspects listed are:	The layout aspects listed are:
• Consistency of buttons • Home page • Site map • Access to help • Multiple ways of navigation	• Consistent look and feel • Appropriate use of colours • Complimentary fonts • Uncluttered interface • Readability • Download time • Printability

The second part of the rating form is simply a blank area where some of the respondents added comments or suggestions (see appendix B for the complete expert interface rating form).

5.3 FINDINGS OF THE QUESTIONNAIRE

Ninety questionnaires were handed out throughout the school (see table 4.1 for detailed analysis), but only 65 were handed back to the researchers.

Statomet (the Department of Statistics, University of Pretoria) statistically processed the results from these 65 questionnaires. The results were summarised in the following tables, listing the questions according to the objectives as set out in Table 5.1. Please note that the first 17 questions focused on **all** respondents (65 in total) but questions 18 - 33 where only completed by respondents who had visited the school's Web site at that stage (17 in total). To make a clear distinction between the different questions, the results of questions 18 - 33 are highlighted throughout this chapter.

Table 5.3 includes all Yes/No questions. The number column shows the number of respondents and the percentage calculated accordingly.

Table 5.3 Questionnaire: Results of Yes/No questions

Objectives	Questions	Yes		No	
		No.	%	No.	%
Objective 1	Q1: Do you use a PC in the course of your work?	58	89	7	11
	Q2: Do you use a PC at home?	*56*	*86*	*9*	*14*
	Q3: Do all members of your family have access to a computer at home?	57	88	8	12
Objective 2	*Q4: Do you use the internet in the course of your work?*	*46*	*71*	*19*	*29*
Objective 3	Q17: Would you like to see more information regarding the history of the school on the Web site?	39	60	26	40
Objective 4	*Q11: Have you visited the Web site of Laerskool Lynnwood yet?*	*18*	*28*	*47*	*72*
Objective 6	Q18: Is the contact information regarding the school portrayed effectively on the Web site?	17	100	-	-
	Q22: Would you like to see more photographs on the Web site?	*14*	*82*	*3*	*18*
Objective 7	Q23: Could you access the Web site in good time?	16	94	1	6
	Q26: Do you think the Web site is user friendly?	*17*	*100*	-	-
Objective 8	Q30: Do you regularly visit the Web sites of other primary schools?	1	6	16	94

The results of two multiple-choice questions with an added Yes/No option are listed in Table 5.4. Both of these questions are focused on objective six to assess the opinion of parents who have visited the Web site regarding the content.

Table 5.4 Questionnaire objective 6: Combined Multiple-choice and Yes/No questions

Questions	Choices	Yes		No	
		No.	%	No.	%
Q20: If you visited the School Diary on the Web site, could you find the necessary information regarding the following aspects?	Quarterly program	16	94	1	6
	Cultural aspects	14	82	3	18
	Sport	13	76	7	24
Q25: Is the content regarding the following aspects sufficient?	Governing Body	13	76	4	24
	GB Committees	12	71	5	29
	Staff	13	76	4	24
	Leader/Pupil Comm	14	82	3	18
	Trust	13	76	4	24
	Publications	15	88	2	12
	Academic issues	13	76	4	24
	Sport activities	13	76	4	24
	Cultural activities	15	88	2	12
	School shop	14	82	3	18
	After school care	14	82	3	18
	Pre-primary phase	16	94	1	6

The results of all multiple-choice questions focussing on objective two (to determine parents' ways and means of access to the Internet) are listed in Table 5.5.

Table 5.5 Questionnaire objective 2: Multiple-choice questions

Questions	Choices	No.	%
Q5: Do you have access to the Internet? Choose only one.	At home	6	10
	At work	26	40
	At home and at work	29	45
	No access	4	5
Q6: If you don't have access, when do you plan to get access?	Within the next 6 months	6	40
	Within the next year	6	40
	Never	3	20

Table 5.6 shows the results on the one multiple-choice question based on objective three (that is to determine what content parents want on the Web site).

Table 5.6 Questionnaire objective 3: Multiple-choice questions

Question	Choices	No.	%
Q10: Would you like to visit the school's Web site for one or more of the following? (Choose as many as applicable)	School Newsletter	51	78
	Information on extra-curricular activities	50	77
	Information regarding meetings	46	71
	The school's Prestige Page	41	63
	Info regarding businesses of parents	19	29
	Info regarding businesses in the area	16	25
	Managerial aspects	33	51
	Academic information	51	78
	Information regarding School Wear	41	68

The results of all multiple-choice questions focussing on objective five (to determine how often the parents want the site to be updated and if they want to be involved) are listed in Table 5.7.

Table 5.7 Questionnaire objective 5: Multiple-choice questions

Questions	Choices	No.	%
Q14: How often should the school's Newsletter be placed on the Web site? Choose only one	Weekly	38	58
	Monthly	20	31
	Quarterly	3	5
	Yearly	-	-
	Not at all	4	6
Q15: How often do you think should the design of the Web site be updated?	Monthly	17	26
	Quarterly	22	34
	Yearly	26	40
Q32: Would you like to be involved in the maintenance and/or development of the Web site regarding:	Design of the Web site	1	6
	Content of the Web site	1	6
	Marketing of the Web site	1	6
	Not at all	14	82

The results on the one multiple-choice question focussing on objective six (to determine the opinions of parents who have visited the web site regarding the content) are listed in Table 5.8.

Table 5.8 Questionnaire objective 6: Multiple-choice questions

Question	Choices	No.	%
Q19: Would you say that the School Traditions are portrayed effectively on the Web site?	Yes	6	35
	No	2	12
	Unsure	9	53

The multiple-choice questions focussing on objective seven (to assess the opinions of the parents who have visited the site regarding the general impression and design aspects) are listed in Table 5.9.

Table 5.9 Questionnaire objective 7: Multiple-choice questions

Question	Choices	No.	%
Q29: What impressed you the most about the Web site?	Home page	9	53
	Sketches and graphics	7	41
	Web layout	8	47
	Contact information	10	59
	Navigational aspects	5	29
	School tradition	5	29
	School Diary	6	35
	Other	-	-

5.4 DISCUSSION OF QUESTIONNAIRE FINDINGS

Although the findings of the questions are grouped in tables according to the type or formulation of each question, I thought it sensible to discuss the findings according to the objectives as listed in Table 5.1.

5.4.1 Objective 1

The findings of all questions focussing on this objective are listed in Table 5.3. The results can be interpreted as follows:

The parents of Laerskool Lynnwood seem to have very high computer literacy levels as:

- 89% of all respondents use a PC in the course of their work
- 86% of all respondents use a PC at home
- 88% of all respondents say that all members of their family have access to a computer at home.

5.4.2 Objective 2

The results of the first question focussing on this objective (question 4) can be found in Table 5.3 and the results of the other two (questions 5 and 6) in Table 5.5. The results can be interpreted as follows:

Most of the parents of Laerskool Lynnwood (95%) do have access to the Internet and know how to use it, because:

- 71% of all respondents use the Internet in the course of their work
- 45% of all respondents have access to the Internet at home as well as at work
- 40% of all respondents have access to the Internet at work only
- 10% of all respondents have access to the Internet at home only

Although only 4 (5%) respondents indicated in question 5 that they do not have access at all , a total of 15 answered question 6, which was actually only focussed on respondents that do not have access at all. My view of this is

that some respondents interpreted the question as focussing on their **home** access and not on **general** access to the Internet (as intended by the researchers). The results should thus be interpreted as:

Of the 15 respondents that commented on their **home** access to the Internet

- 40% plan to get access within the next 6 months
- 40% plan to get access within the next year
- 20% do not plan on getting access at all

Other than this, no other sensible interpretations or generalisations can be made.

5.4.3 Objective 3

Only two questions focussing on determining what content parents want on the Web site were asked to **all** respondents. The results can be seen respectively in Tables 5.3 and 5.6 and can be interpreted as follows:

The most popular suggested content features that the parents would like to see on Laerskool Lynnwood's Web site are:

- Academic information and the school newsletter (both chosen by 78% of all respondents)
- Information on extra-curricular activities, chosen by 77% of all respondents
- Information regarding meetings, chosen by 71% of all respondents
- Information regarding school wear, chosen by 68% of all respondents

The following suggested content features were less popular:

- 63% would visit the prestige page

- 60% would like to see more information regarding the history of the school on the Web site
- 51% would visit the site to find information on Managerial aspects
- 29% would visit the site to find information regarding businesses of parents
- 25% would visit the site to find information regarding businesses in the immediate vicinity of the school

5.4.4 Objective 4

The purpose of this objective was to find out if some parents had visited the Web site:

Only 28% (18) of the total number of respondents had visited the school's Web site at the time that the research was done.

5.4.5 Objective 5

The results of all three questions focussing on this objective are summarised in Table 5.7 and can be interpreted as follows:

Most parents feel very strongly that the school's Newsletter should be placed on the Web site regularly:

- 58% feel that it should be published weekly
- 31% feel that it should be published monthly
- only 5% feel that it should be published quarterly
- 6% feel that it should not be published on the Web site at all

When asked how often they think the design of the Web site should be updated they responded in the following ways:

- 40% feel that it should be updated annually
- 34% feel that it should be updated quarterly
- 26% feel that it should be updated monthly

When asked if they would like to be involved in the maintenance and/or development of the Web site, the response was very negative:

- 82% would not like to be involved at all
- 6% (one respondent) each was interested in maintaining the design or the content
- 6% (one respondent) would like to be involved in the marketing of the Web site

5.4.6 Objective 6

The results of questions focussed on this objective can be found in the following three tables Table 5.3, Table 5.4 and Table 5.8. Only respondents who had visited the school's Web site completed all the questions concerning this objective. The results can be interpreted as follows:

- 100% of the respondents feel that the contact information regarding the school is portrayed effectively on the Web site.
- 82% of the respondents would like to see more photographs on the Web site.

When asked specifically about the information in the school diary

- 94% said that they could find the necessary information regarding the quarterly program

- 82% said that they could find the necessary information regarding cultural aspects
- 78% said that they could find the necessary information regarding sport activities

Respondents were asked about the sufficiency of 12 key topics on the Web site. Only the results of the six with the highest scores are listed; the rest can be seen in Table 5.4:

- 94% of the respondents felt that the content regarding the pre-primary phase at the school is sufficient
- 88% of the respondents felt that both the content regarding school publications and cultural activities are sufficient
- 82% of the respondents felt that the content regarding the pupil/leader committees, the school shop as well as after school care is sufficient.

Results were not very positive with regard to the last question focussing on this objective (see Table 5.8)

- 53% of the respondents were unsure if the school traditions are portrayed effectively on the Web site
- 12% said the it was not portrayed effectively at all
- only 35% felt that it was portrayed effectively

5.4.7 Objective 7

This objective is focussed on determining the opinions of the parents who have visited the site regarding the general impression and design aspects. The results are summarised in Table 5.3 and Table 5.9 and can be interpreted as follows:

100% of the respondents felt that the site was user-friendly, therefore question 27 (asking why the respondent felt that the site was not user-friendly) served no purpose at all.

94% of the respondents said that they could access the site in good time.

When asked what aspect of the site impressed them the most, respondents' opinions varied quite a lot:

- 59% were impressed by the contact information
- 53% were impressed by the home page
- 47% were impressed by the layout of the Web site
- 41% were impressed by the sketches and graphics
- 35% were impressed by the school diary
- 29% were impressed by both the navigational aspects and the school traditions as set out on the site

5.4.8 Objective 8

The purpose of the questions focussing on this objective was to assess the opinions of parents who have visited the Web site regarding how this site compares with other primary school Web sites. Only two questions were asked, the results of the first one is listed in Table 5.3, but as the results were not very significant, the results of question 31 are not listed in a table. The results are:

Only one respondent regularly visits the Web sites of other primary schools and feels that Laerskool Lynnwood's site compares positively with the other sites.

5.5 FINDINGS OF THE EXPERT INTERFACE RATING FORM

As explained in chapter 4, the respondents in this group included 5 people who surf the Internet daily as part of their profession (professional surfers), and 5 students completing the final year of a Web design course. In order to be able to compare opinions, the results were kept separate and are summarised in two tables. The same tables are used by Du Preez (2001) for the purposes of her study. Table 5.10 lists the results of the rating by the professional surfers:

Figure 5.10 Summary of expert interface rating of Laerskool Lynnwood: Professional surfers ✦

Topic	Number/percentage of respondents per rating							
	Excellent		Good		Adequate		Poor	
Navigation:								
Consistency of buttons	5	100%	-	-	-	-	-	-
Home page	*2*	*40%*	*3*	*60%*	-	-	-	-
Site map	2	40%	2	40%	-	-	1	20%
Access to help	*1*	*20%*	*2*	*40%*	*1*	*20%*	*1*	*20%*
Multiple ways of navigation	1	20%	4	80%	-	-	-	-
Layout:								
Consistent look and feel	4	80%	1	20%	-	-	-	-
Appropriate use of colours	*1*	*20%*	*3*	*60%*	*1*	*20%*	-	-
Complimentary fonts	1	20%	3	60%	1	20%	-	-
Uncluttered interface	*1*	*20%*	*4*	*80%*	-	-	-	-
Readability	4	80%	1	20%	-	-	-	-
Download time	*1*	*20%*	*3*	*60%*	*1*	*20%*	-	-
Printable	1	20%	4	80%	-	-	-	-

Comments and suggestions added by the respondents in the blank area includes the following remarks (remarks in inverted commas are given verbatim, other remarks are summarised):

- The grey colour of the buttons does not compliment the site. The colour is "unsightly" and "clutters" the site.
- "The 'back' (terug) and 'up' (op) buttons are two different buttons with the same function".

- One respondent would prefer to see brighter colours on the Home page.
- "The extensive site map would not be of great help for a child who is not clued up with the use of Web sites".
- "There can be more open spaces between the headings and the first paragraphs to avoid confusion".
- "The use of photographs on the site should be 'advertised' by starting with a photograph. Photographs should be better described and should not overlap". Some respondents felt that there are to many photographs and graphics on the site. Others felt that there should be more.
- Two respondents loved the choice of colours, the graphics and the general layout of the site. Others felt that brighter colours would be more suitable for a primary school.
- One respondent felt that more font variations and/or special text can be used and that there are too many large open spaces on the site.
- "An aesthetically beautiful Web site with information applicable to the school and scholars. Excellent work!"

Table 5.11 summarises the ratings of the students in the same format as Table 5.10, they were not asked to add comments:

Table 5.11 Summary of expert interface rating of Laerskool Lynnwood: students ✦

Topic	Number/percentage of respondents per rating							
	Excellent		Good		Adequate		Poor	
Navigation:								
Consistency of buttons	5	100%	-	-	-	-	-	-
Home page	*3*	*60%*	*2*	*40%*	-	-	-	-
Site map	3	60%	2	40%	-	-	-	-
Access to help	*1*	*20%*	*2*	*40%*	*2*	*40%*	-	-
Multiple ways of navigation	1	20%	3	60%	1	20%	-	-
Layout:								
Consistent look and feel	5	100%	-	-	-	-	-	-
Appropriate use of colours	*2*	*40%*	*2*	*40%*	*1*	*20%*	-	-
Complimentary fonts	2	40%	1	20%	2	40%	-	-
Uncluttered interface	*1*	*20%*	*4*	*80%*	-	-	-	-
Readability	3	60%	2	40%	-	-	-	-
Download time	*1*	*20%*	*4*	*80%*	-	-	-	-
Printable	3	60%	2	40%	-	-	-	-

The results were further summarised into averages to give the site two average ratings, which was again averaged into a total mark in order to compare it with the similar scores of 15 other primary school Web sites. An average mark for navigational aspects and one for layout was calculated, added and divided by two to obtain the actual Average Mark for the site. The summary is given in Table 5.12

Table 5.12 Summary of ratings for Laerskool Lynnwood ✦

Topic	Average mark for each topic per group		Average mark for site per topic
	Professional surfers	Students	
Navigation:			
Consistency of buttons	100%	100%	**100%**
Home page	85%	90%	**88%**
Site map	75%	90%	**83%**
Access to help	65%	70%	**68%**
Multiple ways of navigation	80%	85%	**83%**
Average mark for navigational aspects	81%	87%	**84%**
Layout:			
Consistent look and feel	95%	100%	**98%**
Appropriate use of colours	75%	80%	**78%**
Complimentary fonts	75%	75%	**75%**
Uncluttered interface	80%	80%	**80%**
Readability	95%	90%	**93%**
Download time	75%	80%	**78%**
Printable	80%	90%	**85%**
Average mark for layout aspects	82%	85%	**84%**
Average mark for the Web site of Laerskool Lynnwood			**84%**

The results for the interface rating of 15 other primary school Web sites are summarised in Table 5.13. Scores were calculated in the same way as explained for table 5.12.

Table 5.13 Results of interface rating: 15 Primary school Web sites ✦

Ranking	School	Navigational aspects	Layout	Average mark
1	Cook Primary School	80%	89%	**85%**
2	Edleston County	75%	89%	**82%**
3	Rapportryer	70%	82%	**76%**
4	St Martins	65%	79%	**72%**
5	Danie Malan	70%	71%	**71%**
6	Dr Havenga	70%	71%	**71%**
7	Uitsig	65%	68%	**67%**
8	Fleur	60%	71%	**66%**
9	Worcester Noord	50%	82%	**66%**
10	Garsfontein	60%	68%	**64%**
11	Totiusdal	60%	68%	**64%**
12	Menlo Park	50%	75%	**63%**
13	Paratus	55%	68%	**62%**
14	Wonderboom	50%	71%	**61%**
15	Kruinsig	45%	54%	**50%**

5.6 DISCUSSION OF EXPERT INTERFACE RATING FORM FINDINGS

When viewed independently the scores for the Web site of Laerskool Lynnwood, as assessed by the two groups of experts, are very good. However, it can only be placed in perspective by comparing it to the results of the other 15 primary school Web sites.

When viewed independently (see Table 5.12), the Web site of Laerskool Lynnwood has the highest scores for:

- Consistency of buttons (100%)
- Consistent look and feel (98%)

- Readability (93%)
- Home page (88%)

The weak points of the site is seen as:

- The use of complimentary fonts (75%)
- Access to help (68%)

If ranked with the other primary school Web sites (see table 5.13) Laerskool Lynnwood's site has:

- The highest score for navigational aspects
- The third highest score for layout aspects
- The second highest average mark for the complete site

5.7 SUMMARY

Results of both the expert interface rating form and the questionnaire are mostly positive. Final conclusions and recommendations based on the results listed in this chapter, will be discussed in detail in chapter 6.

CHAPTER 6

6 IN CONCLUSION

6.1 INTRODUCTION

This chapter deals with the final conclusions reached in the study with the following main research problem:

To determine what the content of an effective Web site for Laerskool Lynnwood should be and how the site should be constructed to ensure maximum effectiveness for all parties concerned.

The conclusions are discussed in two parts. The first part concentrates on the conclusions for each research question as identified before the research commenced. In the second part, all other conclusions drawn during the research process, development of the Web site and evaluation of primary school Web sites are discussed. There is also a section featuring recommendations based on the research findings and finally a list of suggestions for further research.

As can be seen in Table 6.1 summarising the sub-questions of the research, all developmental questions are discussed in detail in chapter 2 by means of a thorough literature survey. Questions focussing on the specific content for the Web site of Laerskool Lynnwood are discussed in chapters 3 and 5.

Table 6.1 Research questions

Topic addressed	Questions	Discussed in
Development	• What is done during the planning phase of the development of a web site?	• Chapter 2
	• *What is done during the content development phase of constructing a Web site?*	• *Chapter 2*
	• Which design principles must be implemented to ensure an effective site?	• Chapter 2
	• *What role do programming issues play in the construction of Web sites?*	• *Chapter 2*
	• How does one go about marketing and promoting Web site?	• Chapter 2
	• *How should a Web site be maintained to ensure maximum effectiveness?*	• *Chapter 2*
Content	• What is the content of existing primary school Web sites?	• Chapter 3
	• *Who is the audience of Laerskool Lynnwood's Web site?*	• *Chapter 3*
	• Why does the school want a Web site?	• Chapter 3
	• *What information does the school want to put on their Web site?*	• *Chapter 3*
	• What information would the audience want to find on the school's Web site?	• Chapter 5
	• *How should the information be presented to ensure maximum effectiveness?*	• *Chapter 2, 3 & 5*

6.2 CONCLUSIONS PER RESEARCH QUESTION

In this section the conclusions focussed on the sub-research questions are summarised per question.

6.2.1 What is done during the planning phase of the development of a web site?

All sources quoted on this topic stress the importance of a planning phase before commencing to develop a Web site. They agree that developers often

neglect this aspect. They all propose certain methods and processes, but all of these more or less are focussed on common outcomes:

- Determining the primary reason you want to be on the Internet
- Determining who the audience is you want to meet
- Determining why the audience will visit your site

Due to the great value that is attached to this aspect by experts, it was also treated as very important during the development of Laerskool Lynnwood's Web site. In my opinion this contributed greatly to the success of the site. The planning stage of the creation of Laerskool Lynnwood's Web site included:

- A goal analysis
- A target group analysis
- A task analysis
- A media analysis
- An information analysis
- Compilation of a project plan
- A promotional analysis

6.2.2 What is done during the content development phase of constructing a Web site?

The literature discussion for this part of the study was done in three parts:

- Information design

This aspect is discussed in detail in paragraph 2.2.2.1, listing the opinions of several experts, including guidelines and processes that can be followed to:

- ❖ Choose and/or create the relevant information for the web site
- ❖ Decide how to organise this information to have the best possible effect
- ❖ Decide how the information will be presented
- ❖ Construct a sound navigational system
- ❖ Decide on a maintenance system

Based on the feedback from the parents as well as the ratings from the WWW experts as explained in chapter 5, the information design of Laerskool Lynnwood's site can be judged to be excellemt. It will successfully and consistantly communicate the following two messages to all visitors:

- ❖ Visitors will be able to tell what kind of information a site contains and how broad or deep it goes as soon as they arrive by simply reading the site map.
- ❖ On any page, visitors will know where they are, what they can do there, and where they can go from there because of the user-friendly navigational system.

- Enterprise portals

Although schools are not really profitable corporate companies, they are continuously run more and more like companies. For this reason this aspect is also applicable to this school's Web site. This Web site is also a web-based application that enables the school to connect internal and external users to their information system. It plays a key role in business-to-customer (school-to-parent) integration and it connects people, data and applications. Based on the classification system discussed in paragraph 2.2.2.2, it can be classified as an **external** portal based on targeted users and as an **information** portal based on the provided functionality.

- Content management

Experts quoted on this topic referred mostly to development of large corporate Web sites, but they stress that this process is part of the development and maintenance of any site. They mainly focus discussions on the creation of automated content management subsystems, but also mention that the same processes can be done manually.

The content management process for this Web site consisted of manual data collection and document authoring. In creating Laerskool Lynnwood's site, the following steps (as explained in detail in paragraph 2.2.2.3) played an important role:

- ❖ Data retrieval
- ❖ Document storage and management
- ❖ Personalization

Security and access issues were not addressed at all as it was not of any importance for the construction of the school's Web site.

6.2.3 Which design principles must be implemented to ensure an effective site?

A summary of the opinions of various specialists on the subject of Web design, culminated in the following important principles that must be implemented during the design process:

- Determining a site structure
- Creating a visual design for the site
- Defining a navigation system for the site

- Identifying a combination of presentation elements, choosing form text, graphics and sound
- Keeping the fundamental aesthetics of web design in mind: speed, simplicity and clarity

All of these principles were adhered to during the design of Laerskool Lynnwood's Web site and are discussed in detail in chapter 3, focussing on the development of the product.

6.2.4 What role do programming issues play in the construction of Web sites?

According to the specialists quoted in this section of chapter 2, the most important aspect of converting information into web-readable form is having knowledge of HTML. Although many HTML editors and Web page-making applications make it possible to work in this environment without detailed knowledge of HTML and much working effort, the experts still feel that developers should study this area.

Experts further feel that it is unavoidable that HTML will develop into the Extensible Markup Language (XML) that was developed to overcome the limitations of the HTML standard.

A professional Web designer was responsible for the actual development of Laerskool Lynnwood's Web site and handled this part of the project. The site was originally created using a template of Front Page and this initial prototype was changed into the present site by introducing the chosen site metaphor and accompanying special graphics, symbols and buttons.

6.2.5 How does one go about marketing and promoting Web site?

From the expert opinions quoted on this topic, it was concluded that there are two sides to this aspect:

- Using your specific Web site to market a product or products
- Promoting the specific Web site to attract visitors

This aspect was however discussed in detail in the accompanying dissertation of Du Preez (2001) focussing on the Promotion of Web sites and that of Laerskool Lynnwood in particular. A copy of her dissertation can also be found on the accompanying CD.

6.2.6 How should a Web site be maintained to ensure maximum effectiveness?

Experts give many guidelines for maintaining a Web site, but it seems as though the most important aspects are to continuously stay involved and adapt the site. Any site that wants to survive the test of time will constantly need to be checked for effectiveness and workability and the developer needs to stay in constant touch with the users to be able to cater for their (possibly) changing needs.

At this stage the Laerskool Lynnwood Web site is still maintained by the developer, with the help of administration staff and the computer lecturer at the school. Photographs, newsletters and other information that change frequently are updated at least once a month. Ideally the task should be centralised within the school so that changes in important information could be updated daily. The questionnaire also tested the willingness of parents to

take part in the maintenance of the school's Web site, but responses were very negative, with only one respondent each volunteering to assist with the maintenance and promotion of the school's Web site respectively.

6.2.7 What is the content of existing Primary School Web sites?

To answer this question we (the researchers) studied the sites of other Primary Schools as discussed in paragraph 3.3.5.5 the Information Analysis section of chapter 3. The most popular topics for primary school Web sites are:

- General information and rules
- Contact information
- Academic information
- Sport activities
- Management information
- Cultural activities
- Advertisements or a links page
- School History or School Anthem
- Newsletters or circulars

We then went one step further and rated the sites according to the effectiveness of each topic on every site on a four-point scale (see appendix F for a summary of results). We nonetheless got the general impression that few Primary School sites are developed by implementing the processes as discussed and implemented in this study, as many of them are not very comprehensive.

6.2.8 Who is the audience of Laerskool Lynnwood's Web site?

As explained in detail in paragraph 3.3.5.2 listing the results of the target group analysis, the audience of the site is:

- Pupils of the school
- Parents
- Members of the staff
- International visitors
- A wider general audience of people involved with the school and entities associated with the school.

The international visitors are however excluded to a large extent because the school chose not to have at least the home page or other parts of the site in English. This means sacrificing the chance of being contacted by counterparts in other countries and building international relationships.

6.2.9 Why does the school want a Web site?

The answer to this question was found by doing a goal analysis as explained in chapter 3. It culminated in the following main goals:

- Establishing a platform where the school and everybody connected to the school can communicate and exchange important information in a reliable manner.
- Publishing an effective, attractive Web site that can be used as a 'show case' to market the school as such.

6.2.10 What information does the school want to put on their Web site?

Using the analysis of other Primary School Web sites, the document analysis of school documentation as explained in paragraph 3.3.3.1, brainstorming sessions and interviews as explained in paragraph 3.3.3.2 and 3.3.3.3 as well as ideas offered by current staff members, school management and pupils, it was decided that the following list of subjects would form the core of the content for the Web site:

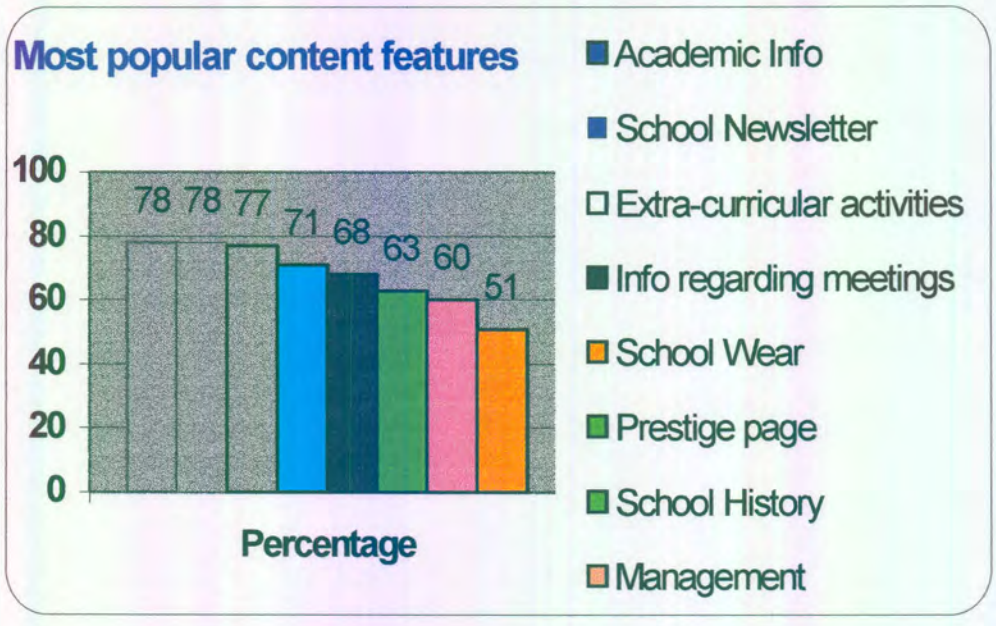
- Management
- Publications
- Academic issues
- Sport
- Cultural activities
- The school shop
- After school care
- Grade R
- Contact information
- What is new on the site
- The school tradition
- The site plan
- School diary

6.2.11 What information would the audience want to find on the school's Web site?

The answer to this question is discussed in detail in paragraph 5.4.3 and the results are summarised in the following graph, illustrating the most popular suggested content features as chosen by the respondents who completed the

questionnaire. The question that this graph is based on, asked respondents to choose one or more topics that they intend visiting the school's Web site for.

Figure 6.1 Graph portraying most popular content features



According to the results of the questionnaire focussing on the parents of Laerskool Lynnwood, the topics as listed in the graph, are the most important topics that they intend visiting the school's Web site for. The results cannot be generalised for other Primary Schools, as preferences would differ depending on factors that are very specific to each school and its community.

6.2.12 How should the information be presented to ensure maximum effectiveness?

The answer to this question is discussed in detail in paragraph 3.3.5.4 as the results of the Media Analysis for this Web site. All presentation media and aspects of good information design are discussed in detail in chapter 2.

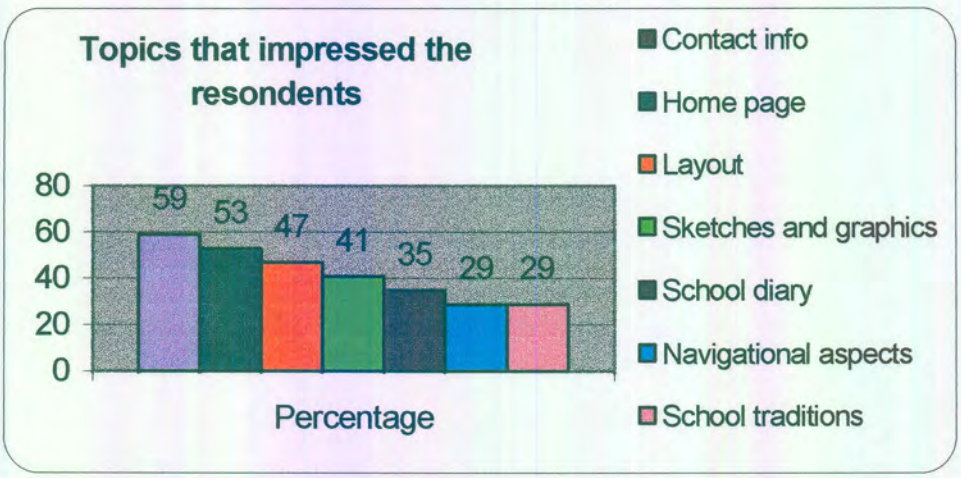
Based on the knowledge gained throughout the complete study, a combination of text and graphics were chosen as presentation medium. Words, tables, charts, illustrations and photographs mainly convey the content of the Web site of Laerskool Lynnwood.

When the users of the Laerskool Lynnwood Web site were asked whether the site was user-friendly, 100% of the respondents answered positively. Experts also evaluated the site using the expert interface rating form as explained in chapter 5. The results were compared to a similar evaluation of 15 other primary schools. The results were very positive, and in summary the school has:

- The highest score for navigational aspects
- The third highest score for layout aspects
- The second highest average mark for the complete site

The following graph illustrates which topics impressed the respondents of the questionnaire that visited the Web site.

Figure 6.2 The most impressive topics on Laerskool Lynnwood's Web site



These results show that there is not really one topic that can be singled out as being the most impressive. This means that it is the combination of all topics that contributes to the overall success of the Web site.

6.3 OTHER CONCLUSIONS

Apart from the conclusions drawn with regard to the specific research questions, I also experienced that traditional "light bulb" feeling when the following aspects of the study were considered.

6.3.1 Information Design of Web sites

According to experts quoted in this study, this is the most important aspect of creating a Web site however, it is the least known aspect and therefore often ignored in the development process. For this reason many Web sites are not constructed well enough or maintained conscientiously and later disappear in the mist of the electronic super-highway. This was the main motivation for us (the researchers) to get involved in the development of Laerskool Lynnwood's Web site and the school's management welcomed our efforts, as they knew it would only improve the end product.

In my opinion many school Web sites and Web sites in general are built without the necessary initial reflection regarding the full extent of such a project. This school was lucky to have the support of several people who are informed on the subject of Web design and especially that of a professional Web designer. It is only once one is in the middle of the whole process that the full impact of this immense task really becomes eminent if one is not aware of the correct procedures from the start.

The nature of applications for Web design that are available today, simplifies the building of a Web site, but in the process this very important aspect of Information Design that precedes the actual construction phase, is very disregarded.

6.3.2 Findings of the questionnaire

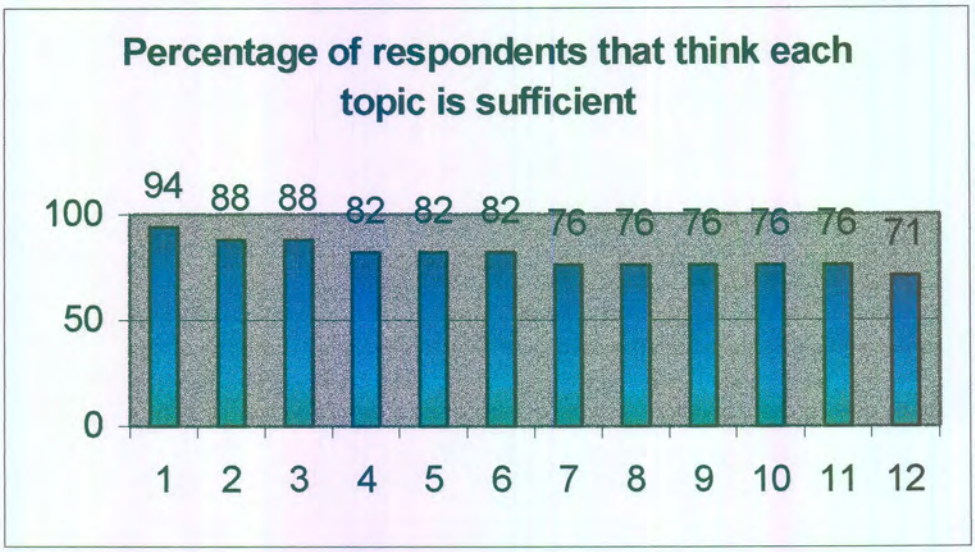
As anticipated by the school, the parents of Laerskool Lynnwood seem to have very high computer literacy levels and most do have access to the Internet and know how to use it. The development of a Web site for the school focussing on the parents and pupils should thus be very successful.

Very few parents who completed the questionnaire had visited the school's Web site at the time of the survey.

The opinions of the parents who had visited the Web site at the time of the survey were very positive regarding the content. In general they could find all the necessary information, but they requested more pictures.

When asked about the sufficiency of the 12 key topics, all aspects were rated as sufficient by more than 70% of the respondents. The results are summarised in figure 6.3. The numbers used in figure 6.3 are defined in Table 6.2.

Figure 6.3 Graph portraying sufficiency of key topics

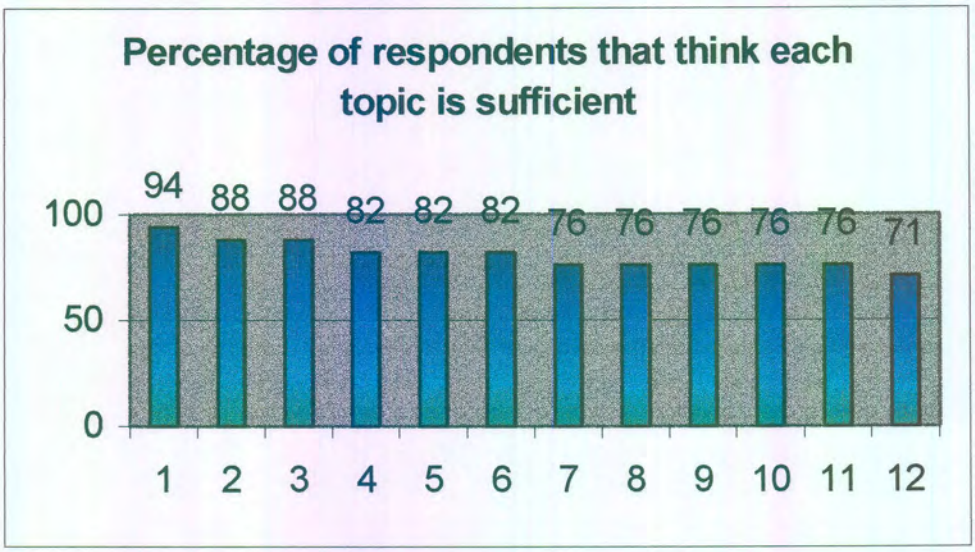


As mentioned in the previous paragraph, table 6.2 lists the topics that are portrayed by numbers in the foregoing graph.

Table 6.2 Topics used in figure 6.3

Number in graph	Topic
1	Pre-primary phase
2	Publications
3	Cultural activities
4	Leader/Pupil committees
5	School shop
6	After school care
7	Governing Body
8	Staff
9	Trust
10	Academic issues
11	Sport activities
12	GB Committees

Figure 6.3 Graph portraying sufficiency of key topics



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9	Trust
10	Academic issues
11	Sport activities
12	GB Committees

These results clearly illustrates the fact that the parents judge most topics to be portrayed sufficiently on the Web site.

Questions focussed on comparing Laerskool Lynnwood's Web site with other Primary School Web sites were not very successful as only one respondent visited other Primary School Web sites. This issue was thus not explored in any further detail.

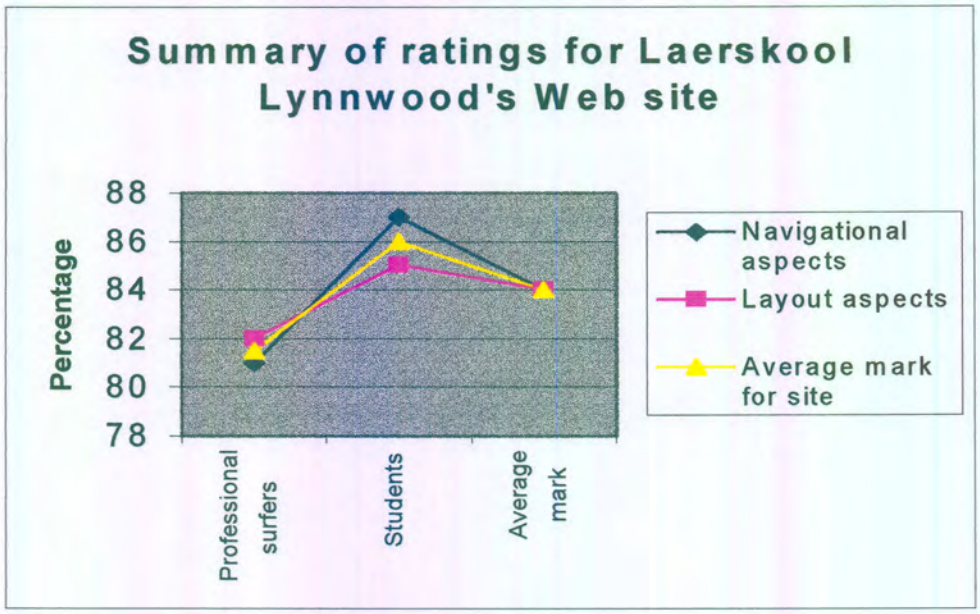
6.3.3 Findings of the expert interface rating forms

Based on the individual comments and suggestions added by the Professional surfers on their rating forms, I conclude the following:

> Personal preferences have a great influence on how different people view a Web site. What one person sees as a positive aspect, another treats as a limitation. If a Web site is planned thoroughly and designed keeping close to the rules as listed in chapter 2, all personal preferences are balanced out and the site will receive the rating it deserves. This is what happened to Laerskool Lynnwood's site and in my opinion the following comment of one respondent summarises it perfectly:
>
> "An aesthetically beautiful Web site with information applicable to the school and scholars".

The graph in figure 6.4 summarises the ratings that Laerskool Lynnwood's site received during the evaluation process as described in chapter 4.

Figure 6.4 Graph portraying ratings of Laerskool Lynnwood's Web site



One can clearly see that all ratings were above 80% and the average rating given by both the professional surfers and the students is 84%. When compared to the ratings of other primary school Web sites (see chapter 5), it is an excellent score.

6.3 RECOMMENDATIONS

I would like to make the following recommendations regarding the development and maintenance of Laerskool Lynnwood's Web site:

- Regularly update newsletters, photographs and all other information that change frequently. Give special attention to important facts like staff changes, dates, venues and times.

- Get the pupils involved in verifying links and scanning the site for possible misinformation or mistakes.

- Use the two dissertations based on the school's Web site to improve the site, promote the school and advertise the Web site. They might even think of using the same questionnaire again to see if aspects that showed unsatisfactory results have improved over time.

6.4 SUGGESTIONS

The following suggestions could be used as a basis for further research in the area of Web design in general or specifically the design of primary school Web sites.

- Use the evaluation of this Web site and the other fifteen primary schools as basis for further research in this area. Incorporate a larger number of primary school Web sites (or any school Web sites) a similar study. A larger target group can enable researchers to make generalisations and statistical manipulations regarding the data obtained.

- Generalise the questionnaire used in this research to evaluate the Web sites of other schools. This can be used for a comparative study on how audiences of school Web sites feel about the different sites.

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Appendix A

Questionnaire focused on parents

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Kantoorgebruik alleenlik				
	Respondent nr			
V1				1 - 3

1. **Gebruik u 'n rekenaar (PC) as deel van u werk?**

Ja	1
Nee	2

V2 ☐ 4

2. **Gebruik u 'n rekenaar tuis?**

Ja	1
Nee	2

V3 ☐ 5

3. **Het almal in die gesin toegang tot 'n rekenaar tuis?**

Ja	1
Nee	2

V4 ☐ 6

4. **Gebruik u die Internet as deel van u werk?**

Ja	1
Nee	2

V5 ☐ 7

5. **Het u toegang tot die Internet? Kies slegs een.**

By die werk	1
By die huis	2
By die huis en werk	3
Geen toegang	4
Ander toegang (spesifiseer)	

V6 ☐ 8

Kantoorgebruik alleenlik

6. **Indien u geen toegang het nie, beplan u om te kry?**

Binne die volgende 6 maande	1
Binne die volgende jaar	2
Nooit	3

V7 [ ] 9

7. **Is u bewus daarvan dat Lynnies 'n Webblad het?**

Ja	1
Nee	2

V8 [ ] 10

8. **Indien "JA", waar het u van die Webblad gehoor? Kies slegs een.**

Personeel van Lynnies	1
Leerling(e) van Lynnies	2
Opedag van Lynnies	3
Ouer(s) verbonde aan Lynnies	4
Ander bron (spesifiseer)	

V9 [ ] 11

Kantoorgebruik alleenlik

9. **Dink u dit is 'n goeie idee om die Web adres op die Volgende items van die skool te adverteer ?**

Skryfbehoeftes	1	V10	12
Skoolhemde (T-hempies)	2	V11	13
Sportdrag	3	V12	14
Sporttoerusting	4	V13	15
Ander (spesifiseer)		V14	16

10. **Sou u die skool se Webblad wou besoek vir: (Kies almal wat van toepassing is)**

Die skool se nuusbrief	1	V15	17
Tye en info oor buitemuurse aktiwiteite	2	V16	18
Tye en info oor vergaderings	3	V17	19
Die skool se spogblad	4	V18	20
Besonderhede oor besighede van ouers verbonde aan skool	5	V19	21
Besonderhede van besighede in u omgewing (bv. Restaurante se spyskaarte ens.)	6	V20	22
Bestuursaangeleenthede	7	V21	23
Akademiese inligting: (soos bv Temas, Prestasies, Toetsdatums)	8	V22	24
Inligting oor skooldrag	9	V23	25

11. **Het u al die Webblad van Lynnies besoek?**

Ja	1	V24	26
Nee	2		

Kantoorgebruik alleenlik

Indien "NEE", beantwoord slegs vrae 12 tot 17
Indien "JA", voltooi asb vrae 12 tot 33

12. Indien u antwoord "Nee" is by nr. 11, wat is die rede? Kies slegs een.

Nie bewus daarvan dat Lynnies 'n Webblad het nie	1
Het nie toegang tot die internet nie	2

V25 [ ] 27

13. In watter taal sou u graag die Web blad op die "WWW" wou hê? Kies slegs een.

Engels	1
Afrikaans	2
Kombinasie van Afrikaans en Engels	3

V26 [ ] 28

14. Hoe gereeld moet die Nuusbriewe van die skool op die Webblad geplaas word? Kies slegs een.

Per week	1
Per maand	2
Per kwartaal	3
Per jaar	4
Glad nie	5

V27 [ ] 29

15. Hoe gereeld voel u moet die ontwerp van die Webblad opgedateer word?

Maandeliks	1
Kwartaaliks	2
Jaarliks	3

V28 [ ] 30

Kantoorgebruik alleenlik

16. **Dink u dat die Webblad genoegsaam bemark word?**

Ja	1
Nee	2

V29 [ ] 31

17. **Sou u meer oor die geskiedenis van Lynnies op die Webblad wou hê?**

Ja	1
Nee	2

V30 [ ] 32

As u nog nie die webblad besoek het nie, hoef u nie verdere vrae te beantwoord nie.
Baie dankie vir u samewerking en besoek ons gerus by

www.lynnwoodlaer.co.za

18. **Word die skool se kontakinligting effektief weergegee op die Webblad? Kies slegs een.**

Ja	1
Nee	2

V31 [ ] 33

19. **Sou u sê die skooltradisies van Lynnies word effektief weergegee op die Webblad?**

Ja	1
Nee	2
Onseker	3

V32 [ ] 34

Kantoorgebruik alleenlik

20. Indien u die Skooldagboek van Lynnies op die Webbladsy besoek het, kon u die nodige inligting inwin oor die volgende aspekte?

	JA	NEE			
Kwartaal Program	1	2	V33		35
Kultuur	1	2	V34		36
Sport	1	2	V35		37

21. Is u van mening dat Lynnies se Webblad voornemende ouers positief kan beïnvloed om hierdie skool te kies?

Ja	1	V36		38
Nee	2			

22. Sou u verkies om meer foto's op die Webblad te hê?

Ja	1	V37		39
Nee	2			

23. Kon u vinnig genoeg toegang tot die Webblad van Lynnies verkry?

Ja	1	V38		40
Nee	2			

24. Hoe gereeld besoek u die Webblad van Lynnies?

Daagliks	1	V39		41
Weekliks	2			
Maandeliks	3			
Minder gereeld	4			

Kantoorgebruik alleenlik

25. Is die inligting op die Webbladsy aangaande die volgende voldoende?

	JA	NEE			
Bestuursliggaam	1	2	V40		42
BL Komitees	1	2	V41		43
Personeel van Lynnies	1	2	V42		44
Leierraad en Leerlingraad	1	2	V43		45
Laerskool Lynnwood Trust	1	2	V44		46
Publikasies van Lynnies	1	2	V45		47
Akademie van Lynnies	1	2	V46		48
Sport aktiwiteite van Lynnies	1	2	V47		49
Kulturele aktiwiteite van Lynnies	1	2	V48		50
Lynnies se winkel	1	2	V49		51
Naskoolsentrum van Lynnies	1	2	V50		52
Inligting oor Graad R klasse	1	2	V51		53

26. Dink u die Webblad van Lynnies is gebruikersvriendelik?

Ja	1	V52		54
Nee	2			

27. Indien u antwoord "Nee" is by nr. 26, wat is u rede?

Inligting oorvleuel onnodiglik	1	V53		55
Inligting word nie volledig uiteengesit nie	2	V54		56
Beweging tussen afdelings lomp	3	V55		57
Gebruikersleidrade onduidelik of onvolledig	4	V56		58
Ander (spesifiseer)		V57		59

Kantoorgebruik alleenlik

28. Watter tye van die dag besoek u die Webblad?

Soggens	1	V58	60
Middae	2	V59	61
Saans	3	V60	62

29. Wat het u die meeste beïndruk van Lynnies se Webblad?

Tuisblad	1	V61	63
Sketse en grafika	2	V62	64
Web uitleg	3	V63	65
Kontak Inligting	4	V64	66
Web navigasie	5	V65	67
Skooltradisie	6	V66	68
Skooldagboek	7	V67	69
Ander (spesifiseer)		V68	70

30. Besoek u gereeld ander laerskole se webbladsye?

Ja	1	V69	71
Nee	2		

Kantoorgebruik alleenlik

31. **Indien "JA" by vrg 30, hoe vergelyk die Webblad van Lynnies met die Webbladsye van ander Laerskole?**

Goed	1
Swak	2

V70 ☐ 72

32. **Sou u graag betrokke wou wees by die instandhouding en/of ontwikkeling van die Webblad ten opsigte van:**

Ontwerp van die Webblad	1
Inhoud van die Webblad	2
Bemarking van die Webblad	3
Nee	4

V71 ☐ 73
V72 ☐ 74
V73 ☐ 75
V74 ☐ 76

33. **Sou u die skool se Webblad wil gebruik as Bemarkingsmedium vir u eie firma?**

Ja	1
Nee	2

V75 ☐ 77

34. **Hoeveel kinders het u in Laerskool Lynnwood in die volgende groepe:**

Gr 1 tot 3	
Gr 4 tot 7	

V76 ☐ 78
V77 ☐ 79

Voltooi asb u besonderhede op meegaande skeurstrokie en handig afsonderlik van vraelys in om anonimiteit tov vraelys te verseker.

Baie dankie vir u vriendelike samewerkin

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Laerskool Lynnwood

HOOP : GLO : DIEN

Roderickweg
LYNNWOOD, 0081

Posbus 20292
ALKANTRANT, 0005

Telefoon: 348-8894
348-1306
Faks: 348-1305

LYNNIES SE WEBBLADSY

Geagte respondent en ouers

Ons is besig om vir ons skool 'n tuiste op die Internet te skep! Die leerlinge en personeel is baie opgewonde hieroor en hopelik sal u ons entoesiasme deel.

Ons skool se webblad is dan ook die studieterrein van 'n navorsingsprojek deur twee Magister-studente van die Universiteit van Pretoria - Mariaan Greyvenstein en Hendrihette du Preez. Hulle werk hard saam met die ontwerper, Anneke van Rooyen om te verseker dat ons blad uniek, effektief en nuttig is.

Om bogenoemde te verseker, versoek ons u om asseblief meegaande vraelys te voltooi en so spoedig moontlik aan u kind se register onderwyser(es) terug te stuur. Hierdie inligting sal verseker dat ons webblad ook sover moontlik aan u persoonlike vereistes sal voldoen.

Let asseblief op die volgende:

- Vraelys word anoniem ingevul.
- In hierdie vraelys word inligting omtrent uself, rekenaar toegang en -gebruik, web toegang en -gebruik, en rekenaarvaardigheid verlang.

- Die vraelys is in die volgende afdelings ingedeel:

  Vraelys wat anoniem voltooi word
  Skeurstrokie wat apart ingehandig word

Algemene instruksies:

- Die vrae word beantwoord deur 'n kring om die toepaslike nommer te trek of in die gearseerde area te skyf.

Stuur asb. Die voltooide vraelys aan u kind se register onderwyser met skeurstrokie **apart** om anonimiteit tov vraelys te verseker. Skeurstrokie se inligting gaan slegs deur die skool se personeel gebruik word vir algemene administratiewe doeleindes. Slegs die vraelyste word aan die navorsers oorhandig.

PG LOUW
UITVOERENDE HOOF

Appendix B

Expert interface rating form

TOPIC	FREQUENCY OF OCCURRENCE ON THE WEB SITE OF LAERSKOOL LYNNWOOD			
	EXCELLENT	*GOOD*	*ADEQUATE*	*POOR*
NAVIGATION: Consistency of Buttons				
Home Page				
Site Map				
Access to Help				
Multiple Ways of Navigation				
LAYOUT: Consistent Look and Feel				
Appropriate Use of Colours				
Complimentary Fonts				
Uncluttered Interface				
Readability				
Download Time				
Printable				

4 = Excellent 3 = Good

2 = Adequate 1 = Poor

Appendix C

Site map of Laerskool Lynnwood's Web site

Lynnwood Tuisblad

- Bestuur
  - Bestuursliggaam
    - Strategie&Bedryfsplanne
  - BL Komitees
    - Finansiele Komitee
    - Geboue en Terrein
    - Bemarking
    - Buitemuurs
    - Ontwikkeling
    - Rekenaar
    - Wiskunde
  - Personeel
  - Leierraad en Leerlingraad
    - Leierraad
    - Leerlingraad
    - Skakelraad
  - Laerskool Lynnwood Trust
    - Aksie Lynnwoodkomitee
- Publikasies
  - Lynnies se Beeld
    - 27 Julie 2001
    - 2 Augustus 2001
    - 16 Augustus 2001
    - 23 Augustus 2001
    - 30 Augustus 2001
    - 6 September 2001
- Akademie

Web gasheer:

EPI-USE

Stuur e-pos aan lynnwoodlaer@intekom.co.za indien u enige kommentaar of vrae oor hierdie webblad het
Datum bygewerk: February 11, 2001

Web ontwerp:

Anvar Business Systems

Appendix D

Proforma completed by staff of Laerskool Lynnwood

Vul asb die volgende document so volledig moontlik in. Dit is slegs 'n riglyn, gee asb soveel besonderhede as moontlik.

Aktiwiteit: _____

Naam van organiseerder(s)/afrigter(s): _____

_____

Kontaknommer(s): _____

Datums: _____

Tye: _____

Opsomming van prestasies:

Afrigter/organiseerder: _____

Leerlinge: _____

Algemene opmerkings:

_____

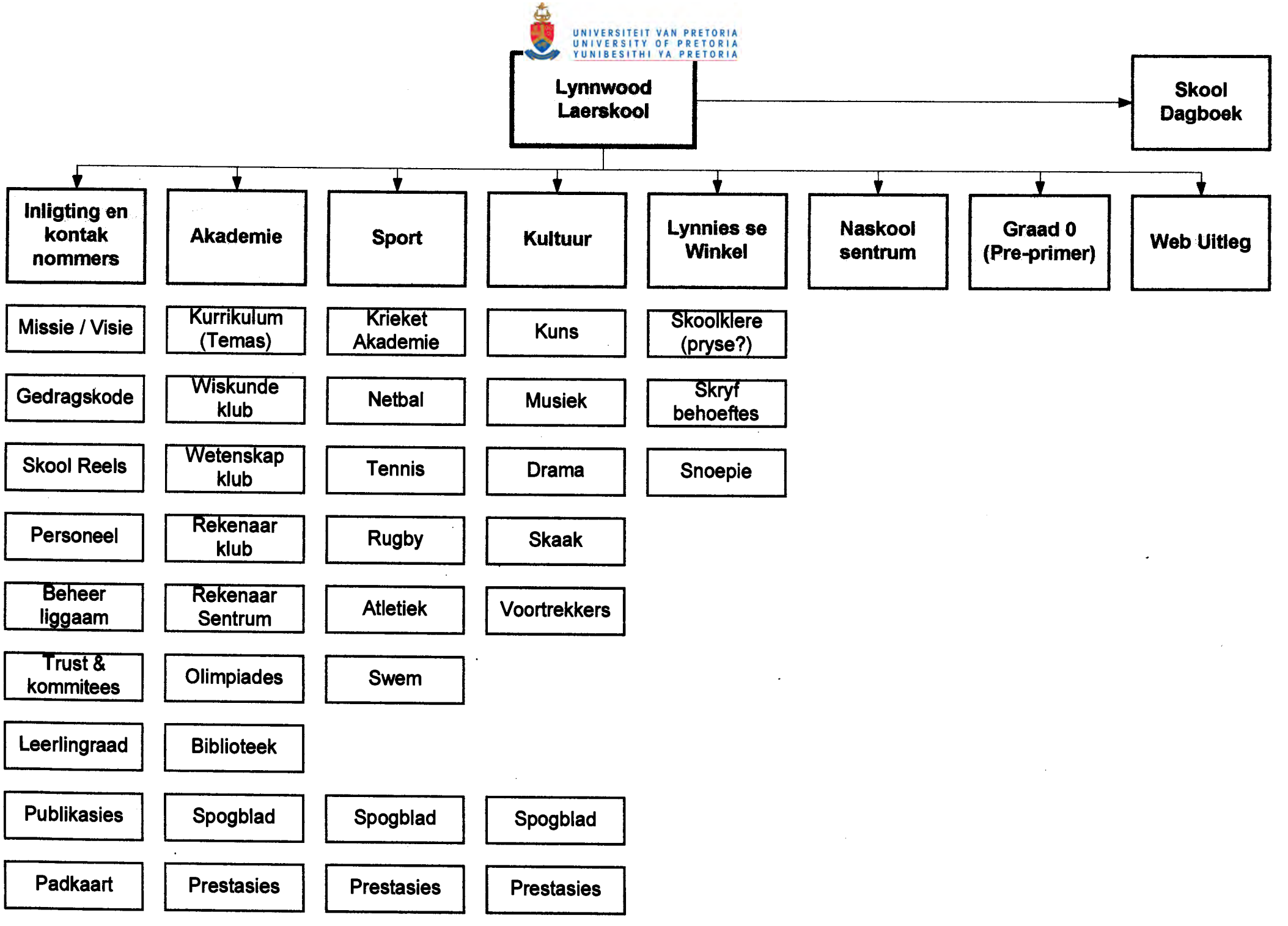
_____

_____

_____

Appendix E

Example of flowcharts used during the development of Laerskool Lynnwood's Web site


UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA
Lynnwood Laerskool
Skool Dagboek
Inligting en kontak nommers
Akademie
Sport
Kultuur
Lynnies se Winkel
Naskool sentrum
Graad 0 (Pre-primer)
Web Uitleg
Missie / Visie
Kurrikulum (Temas)
Krieket Akademie
Kuns
Skoolklere (pryse?)
Gedragskode
Wiskunde klub
Netbal
Musiek
Skryf behoeftes
Skool Reels
Wetenskap klub
Tennis
Drama
Snoepie
Personeel
Rekenaar klub
Rugby
Skaak
Beheer liggaam
Rekenaar Sentrum
Atletiek
Voortrekkers
Trust & kommitees
Olimpiades
Swem
Leerlingraad
Biblioteek
Publikasies
Spogblad
Spogblad
Spogblad
Padkaart
Prestasies
Prestasies
Prestasies

Appendix F
Results of the content topic rating of 15 Primary School Web sites

School ⇨ / Topic ⇩	Laerskool Kruinsig	Laerskool Wonderboom	Cook Primary School	Laerskool Fleur	Laerskool Paratus	Laerskool Danie Malan	St Martin's School	Laerskool Menlo Park	Edleston County Primary	Laerskool Dr Havinga	Laerskool Uitsig	Laerskool Rapportryer	Worcester Noord Primêr	Laerskool Garsfontein	Laerskool Totiusdal
Academic information	1	1	4	0	0	2	4	4	2	3	0	1	1	0	0
Admission requirements	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0
Advertisement/Links page	3	0	3	0	0	3	3	1	4	2	3	0	0	0	0
After school care	0	0	4	2	0	3	0	0	0	1	0	1	2	1	0
Contact information	1	2	3	4	3	3	3	3	3	4	3	3	0	3	1
Cultural activities	3	1	2	1	0	4	0	2	0	1	1	1	2	2	1
Current projects	0	0	0	0	0	3	4	2	2	0	3	0	0	0	0
Exceptional facilities	0	0	3	1	0	0	0	3	3	0	2	0	1	0	0
General information/rules	0	1	4	3	2	2	2	2	3	3	2	2	3	3	0
Guide for new parents	0	0	0	2	0	3	0	0	3	0	0	0	0	0	0
Management information	0	0	2	3	2	3	2	2	0	0	0	3	3	3	0
Newsletters/circulars	0	0	4	3	0	2	2	0	4	2	2	0	0	0	2
Parental involvement	0	2	3	0	0	0	0	0	3	0	0	0	0	0	0
Personnel information	0	0	2	1	0	2	0	1	0	2	2	0	3	0	0
Photo page	0	0	0	0	0	4	0	0	0	0	0	0	4	0	0
Prestige page	0	0	0	0	0	3	3	0	3	0	0	0	0	0	0
School history/Anthem	0	0	4	3	2	4	0	2	2	0	2	2	3	0	3
School publications	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
School shop	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0
School/Roadmaps	0	0	0	0	0	0	0	0	3	0	0	0	0	2	0
Site map	0	0	3	0	0	0	4	0	0	0	0	0	0	0	0
Sport activities	2	0	2	3	0	3	0	2	0	1	1	2	2	2	1
Vision/Mission/Policy	0	2	0	3	3	0	2	2	0	2	1	4	2	0	0
What's on at school	3	0	0	0	0	2	3	3	3	0	2	0	0	0	0
Year/semester plan	0	0	0	0	0	3	0	0	3	2	3	3	2	3	0

Ratings:

4	=	EXCELLENT	2	=	GOOD
3	=	ADEQUATE	1	=	POOR
0	=	TOPIC NOT FOUND ON WEB SITE			

Appendix G

Results of the interface rating of 15 primary school web sites

School ⇨ / Topic ⇩	Laerskool Kruinsig	Laerskool Wonderboom	Cook Primary School	Laerskool Fleur	Laerskool Paratus	Laerskool Danie Malan	St Martin's School	Laerskool Menlo Park	Edleston County Primary	Laerskool Dr Havinga	Laerskool Uitsig	Laerskool Rapportryer	Worcester Noord Primêr	Laerskool Garsfontein	Laerskool Totiusdal
NAVIGATION: Consistency of Buttons	2	2	4	2	2	4	2	3	4	4	4	4	1	2	2
Home page	3	2	4	4	2	2	4	2	4	2	2	4	4	2	2
Site Map	3	2	4	2	2	2	2	2	2	2	2	2	2	2	2
Access to Help	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Multiple Ways of Navigation	3	1	4	3	3	4	2	3	4	4	2	2	3	2	2
LAYOUT: Consistent Look and Feel	1	3	4	2	2	2	4	2	4	2	2	4	2	2	2
Appropriate Use of Colors	3	3	2	3	3	2	4	2	4	3	3	2	2	3	2
Complimentary Fonts	2	3	4	2	2	2	2	2	4	2	3	2	2	2	3
Uncluttered Interface	3	2	4	2	2	2	2	2	2	2	2	4	2	2	3
Readability	3	2	4	4	2	2	2	4	4	3	2	2	2	2	3
Download time	3	4	2	3	3	3	3	3	2	4	2	3	4	3	4
Printable	2	4	2	2	2	2	2	2	2	2	2	2	4	2	2

4 = EXCELLENT 2 = GOOD

3 = ADEQUATE 1 = POOR