CHAPTER 3: RESEARCH DESIGN

This chapter will discuss the research methodology used in this study. It first offers a brief outline of action research as a research method, then continues with a detailed description of the research project undertaken to establish a web-based information resource for Afrikaans First language teachers.

3.1 Action research

This study was planned and developed as an action research project. The aim of action research is to "bring about practical improvement, innovation, change or development of social practice, and the practitioners' better understanding of their practices" (Cohen et al 2001:227). Kemmis & McTaggart (1988:10) describe action research as "… to plan, act, observe and reflect more carefully, more systematically, and more rigorously than one usually does in everyday life; and to use the relationships between these moments in the process as a source of both improvement and knowledge".

The term **action research** highlights the essential features of action and research, which involves the systematic testing of ideas in practice to improve social conditions and increase knowledge (Hatten, Knapp & Salonga 1997).

Action research lies within the domain of formative and evaluation research (Mouton 2001:158). It implies that the research is undertaken to evaluate a real life problem, seek and plan systematically for a solution to the problem, implement the solution, and evaluate whether the intervention was successful.

Kurt Lewin (1948), a social psychologist, developed the concept of action research. He described action research as a spiral of steps, each consisting of planning, action and evaluation. Cohen et al (2001:229) depict an action research project as "a spiral of cycles of *planning*, *acting* (implementing plans), *observing* (systematically), *reflecting*… and then re-planning, further implementation, observing and reflecting".

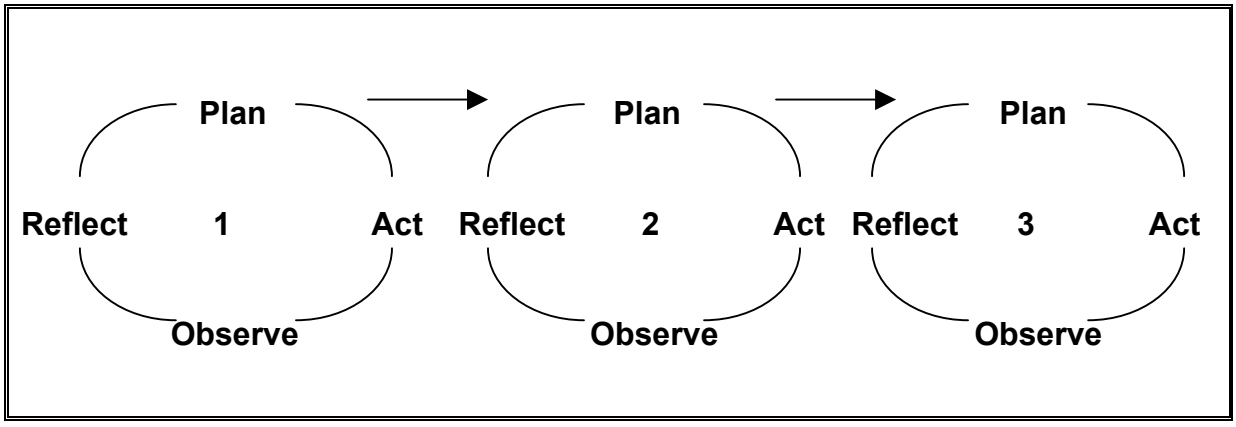
Kemmis (1981), McLean (1995) and Zuber-Skerritt (1992) are amongst those that see the action research process as consecutive spirals or cycles of observing,

planning, acting, and reflecting. This can result in an ongoing process. Brown and McIntyre (1981:245) expand on it as follows:

> "The research questions arise from an analysis of the problems of the practitioners in the situation and the immediate aim then becomes that of understanding those problems. The researcher/actor, at an early stage, formulates speculative, tentative, general principles in relation to the problems that have been identified; from these principles, hypotheses may then be generated about what action is likely to lead to the desired improvements in practice. Such action will then be tried out and data on its effects collected; these data are used to revise the earlier hypotheses and identify more appropriate action that reflects modification of general principles. Collection of data on the effects of this new action may then generate further hypotheses and modified principles, and so on as we move towards a greater understanding of, and desirable change in, the practice that is achieve."

Zuber-Skerritt (1992:13) proposes a four-moment action research model, which represents the cycles of action research as consisting of four major moments: plan, act, observe and reflect. Figure 3.1 represents this research model.

Figure 3.1: Zuber-Skerritts' four-moment action research model



The four-moment action research model includes the following activities:

- ***Planning***:

This stage involves problem identification. The problem is systematically analysed, research questions are formulated and a strategic plan for action on how to address the problem is outlined.

- ***Action/ implementation***:
  In this phase the strategic plan is implemented. This might involve some intervention or action to address the problem.

- ***Observation/ evaluation***:
  The researcher observes the outcomes of the strategic plan in this phase. The action taken in the previous phase is evaluated with appropriate methods and techniques.

- ***Critical reflection***:
  In this phase of the action research cycle the researcher reflects critically on the results of the evaluation, i.e. on the whole action taken and the research process itself. The researcher identifies a new problem and the process can start all over again.

From the action research model it is evident that problem solving is central in this type of research – usually a problem that is of immediate concern to the practitioner. Van Ryneveld (2000: 43) maintains that action research is an effective and innovative way to make "academic research relevant to the overwhelming problems that confront education in South Africa".

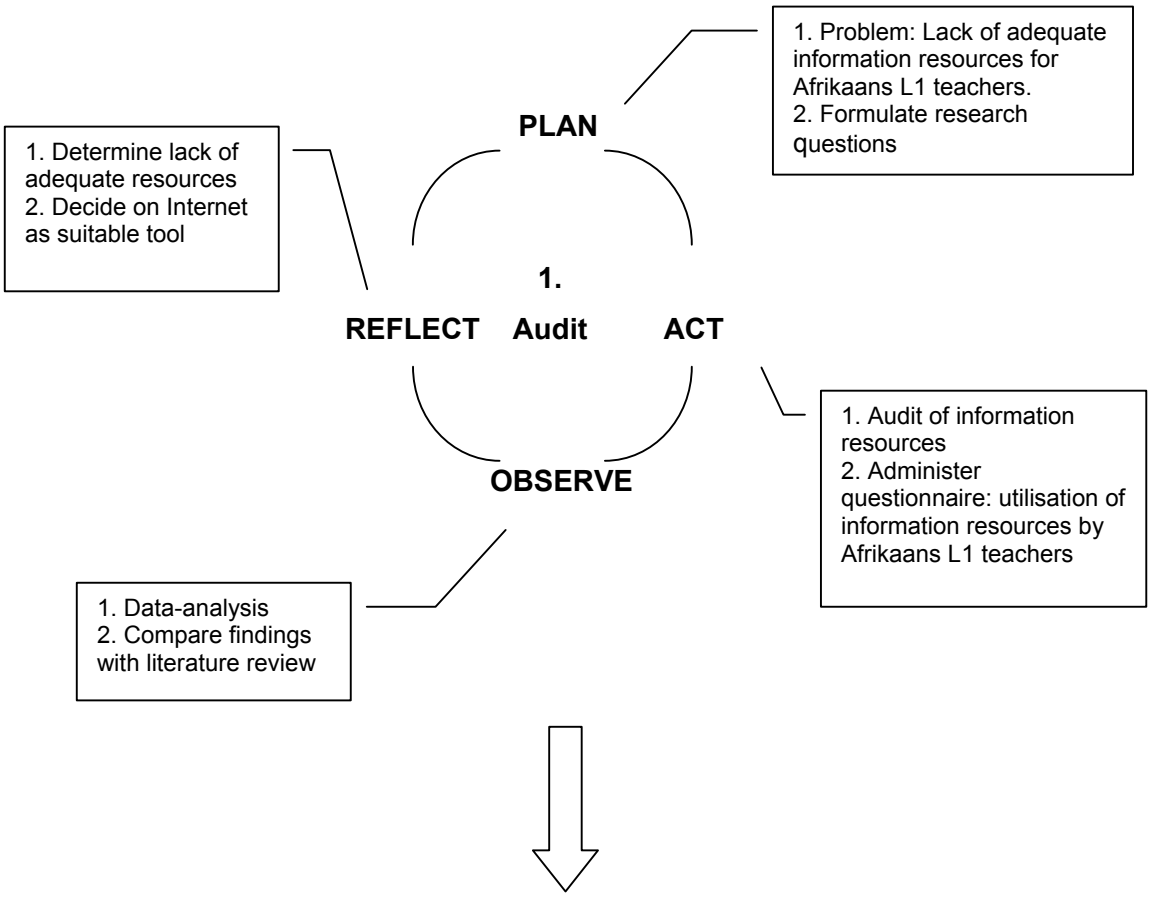
It is within this paradigm that this study has been conducted. The research was an attempt to understand, improve and reform practice. A lack of effective information resources for Afrikaans Language teachers was identified and the researcher decided to find the best possible way to address this problem. A web site for these teachers seemed a good option, but such a project had to be planned systematically and guided through empirical research. True to the characteristics of action research this study moved through various cycles and used a variety of instruments for data collection within each cycle.

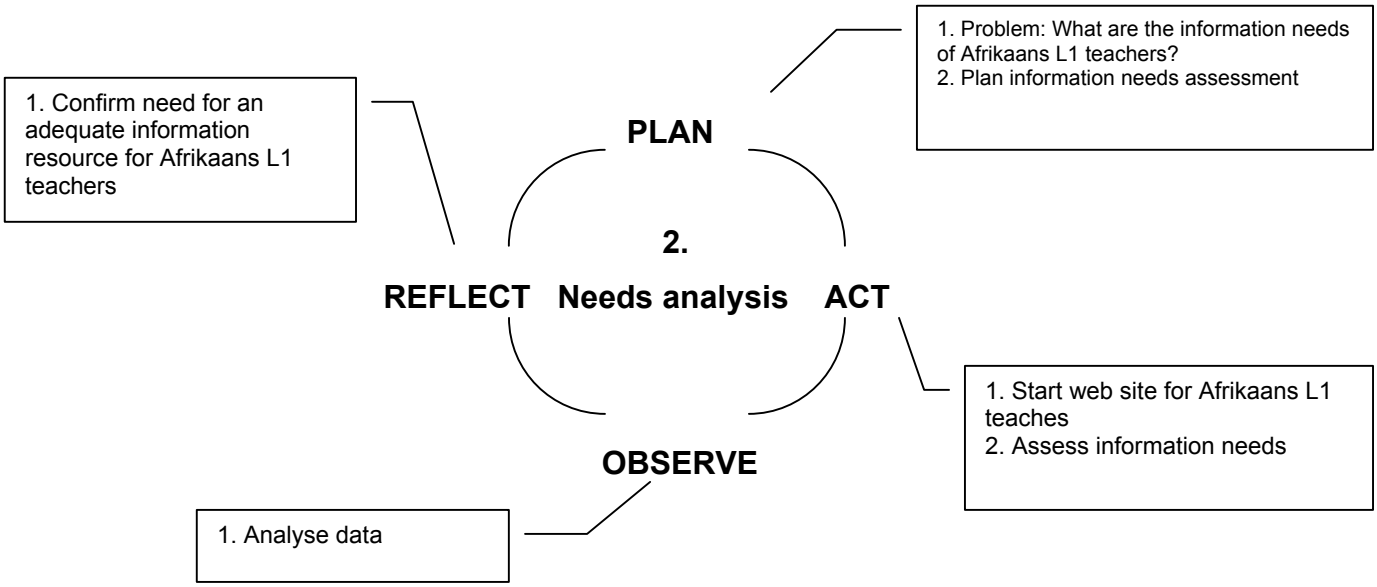
The research process, reflecting the main concern and activity of the various stages of the research, went through the following three cycles:

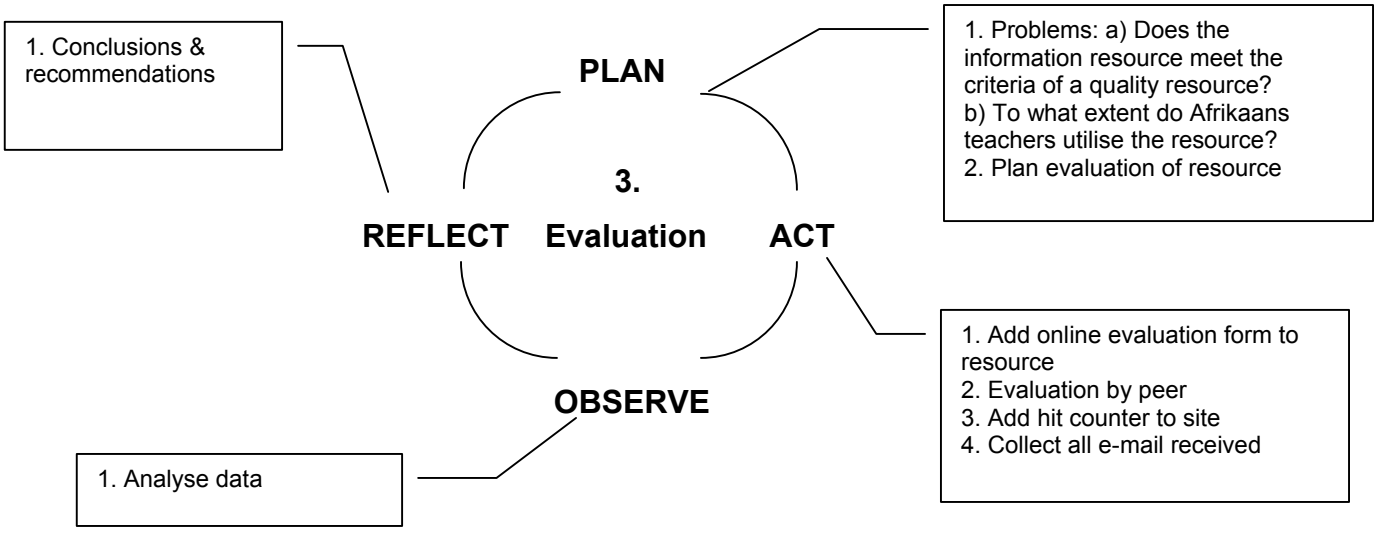
1. Audit of existing information resources for Afrikaans First Language teachers
2. Analysis of the information needs of the intended target group
3. Evaluation of the resource

Figure 3.2 represents a summary of the different cycles of this research.

Figure 3.2: The Four-moment action research cycles of this study







In each stage of the research, data was collected to answer the research questions relevant at that particular stage of the research. Various data collection methodologies were used to find answers to the issues raised by the critical research question of this study.

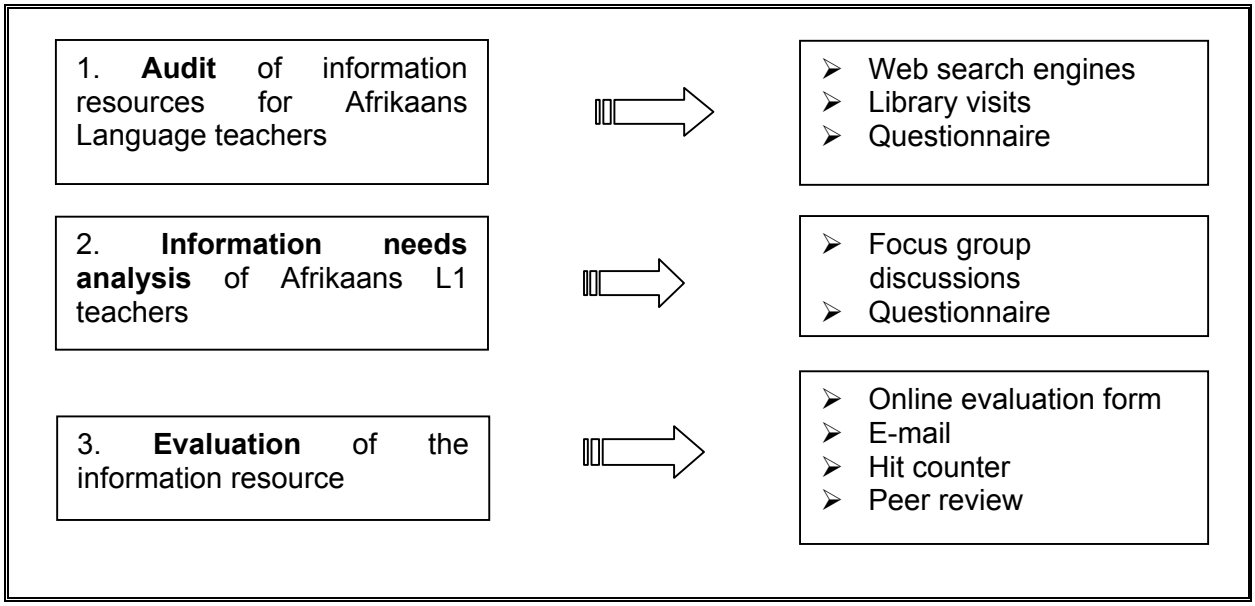
The next section deals in detail with the research design and data collection methodologies of this study.

3.2 Detailed research design and data collection methodologies

An empirical study such as this evaluation research typically makes use of hybrid forms of data and uses multiple methods of data collection (Mouton 2001:158,159). As the research process develops, new research questions arise and in order to answer these satisfactorily, appropriate means of data collection have to be applied.

Figure 3.3 presents a graphical representation of the research process and of the data-collection methods used at each stage/ cycle:

Figure 3.3: A graphical representation of the research process



The data collection methodologies within each of the three cycles will now be dealt with in detail.

3.2.1 Cycle One: Audit of information resources

There is obviously no need for an information resource if similar resources are available. It was therefore necessary to do a thorough survey of information resources available for Afrikaans language teachers to ensure that the web site

intended for Afrikaans language teachers will not be a duplication of something similar.

The questions at this stage of the research were:

- What information resources are available for Afrikaans language teachers?
- How do Afrikaans L1 teachers use and value these resources?
- Do Afrikaans L1 teachers utilise the Internet as an information resource, and what are the contributing factors in this regard?

In order to derive at answers for these initial questions, a thorough search of available information resources for Afrikaans L1 teachers had to be done. The instruments used to conduct these searches will be discussed now.

3.2.1.1 Data collection instruments in Cycle One

1. Web search engines

Web search engines are popular tools for locating web pages. Search engines crawl the Web and log the words from web pages in their databases. Search engines used for this study include Google, Yahoo, AltaVista and Aardvark. Searches were conducted with the following key words, concepts and subject directories:

- "Afrikaans" + "onderwys*" (Teach*)
- "Afrikaansonderwys*"
- "Afrikaans" plus combinations such as:
    - Kurrikulum (Curriculm)
    - Letterkunde (Literature)
    - Lesidees (Lesson ideas/ plans)
    - Hulp (Help)

The home pages of all the tertiary institutions in South Africa were visited. The web sites of their Afrikaans Departments were explored for indications of contributions or information for Afrikaans language teachers.

Thirdly, a search was done on all South African education web sites for references to the different learning areas/ subjects. Finally, the home pages of South African Internet Service Providers such as M-Web and Atlantic were visited to determine whether they provide any educational resources in Afrikaans or even possibly for Afrikaans language teachers.

Web-based searches were done twice – once in September 1999 and then again in the middle of 2001. This was done do monitor the development of Internet resources, since no matches were found in the 1999 search.

2. Library catalogue

By means of the search facilities of the Academic Service Unit of the University of Pretoria thorough searches were done for electronic and paper-based information resources dedicated to Afrikaans language teachers.

3. Questionnaire

A questionnaire was designed to investigate, amongst others, the information resources Afrikaans First Language teachers use and how often they use these resources (Addenda A and B). The questionnaire consisted mainly of closed questions. It was tested on colleagues of the researcher who have taught Afrikaans First Language for several years. A covering letter for the final questionnaire was drafted to indicate to the participants the aim, importance and benefits of the research.

3.2.1.2 Selection of participants

Non-probability sampling is frequently used in action and small-scale research (Cohen et al 2001:102). For the purposes of this study convenience sampling (a form of non-probability sampling) was done. It involves choosing respondents to whom the researcher has easy access. This was done because of financial constraints.

A group of 78 Afrikaans First Language teachers who attended a conference at the University of Pretoria in September 2000 were asked to participate in the research. This group was chosen because the researcher delivered a paper at the same

conference and it was convenient and cheap to circulate the questionnaires at the conference. It resulted in a high response-rate.

The selectivity of a non-probability sample is recognised. The data from these questionnaires cannot be generalised for the wider population of Afrikaans First Language teachers, but at this early stage of the research it gave valuable direction to the project.

3.2.1.3 Data analysis in Cycle One

Findings from the web- and library searches were listed and documented (see Chapter 4). The data from the questionnaire was coded. Staff members from STATOMET at the University of Pretoria post-coded the data. Comparisons were generated through selecting the type of school (primary or secondary school) as a main variable.

The findings from the data analysis are presented fully in Chapter 4.

3.2.2 Cycle Two: Information needs analysis

From the study of the literature it was clear that an information resource should be grounded in a firm knowledge of the information needs of the intended target population (Chapter 2.1.3). The questions at this stage of the research were:

- What are the information needs of Afrikaans First Language teachers?
- Are there any significant differences in the information needs of primary and high schools teachers?

A needs analysis is usually rooted in evaluation research such as is the case with this study (Cohen et al 2001:390). Data required for needs analysis can be derived from several sources, for example:

- *Quantitive data* – such as structured interviews, surveys and questionnaires
- *Qualitative data* - focus group discussions and case studies

A questionnaire was administered to gather quantitive data on the information needs of Afrikaans First Language teachers. Through focus group discussions more information could be obtained than from a questionnaire.

3.2.2.1 Data collection instruments in Cycle Two

1. Questionnaire

The questions used to investigate the information needs of Afrikaans L1 teachers, were part of the questionnaire discussed in Cycle One. The questions probing the information needs also investigated the teachers' utilisation of information resources and the Internet. A questionnaire at the early stages of the web site development would give valuable direction to the kind of information the intended target population wants.

2. Focus groups

Focus groups are a form of group interview. Valuable data can emerge from the interaction between group members and responses from the groups. Cohen et al (2001:288) call focus groups "contrived settings, bringing together a specifically chosen section of the population to discuss a particular given theme or topic, where the interaction with the groups leads to data and outcomes". One of the strengths of a focus group is that it is very focused on a particular issue and will therefore yield insights that might not otherwise have been achievable through other data collection methods such as questionnaires.

The topic of the focus group discussions for this research was the information Afrikaans L1 teachers need to fulfil their professional duties. Participants formed smaller groups, wrote down their feedback and reported back to the larger group.

3.2.2.2 Selection of participants

At the seminar for Afrikaans language teachers at the University of Pretoria in September 2000 (mentioned in Cycle One) semi-structured focus group discussions with Afrikaans L1 teachers were conducted. Two separate sessions of focus group discussion were held with primary and secondary school teachers.

Once again it needs to be mentioned that the sampling for this study was convenience sampling. Many of these teachers were from schools in and around Pretoria, where there are a variety of good libraries and teacher support centres available. Their responses and needs would nevertheless indicate trends among the target population of the web site, and could therefore count as a good starting point.

3.2.2.3 Data analysis in Cycle Two

Data from the questionnaire were treated as in Cycle One, with the type of school the main variable. It is necessary to discern between the information needs of primary and high school teachers, since they work with different syllabuses.

The researcher conducted the focus group discussions personally, with the teachers' feedback recorded, analysed and listed. The lists of information needs compiled in their smaller groups were collected.

Chapter 4 reports on the findings from the data analysis done in Cycle Two of the research.

3.2.3 Cycle Three: Evaluation of the web-based information resource

The online information resource for Afrikaans language teachers, the *Goudmyn,* was developed after the findings of the research done in Cycles One and Two were scrutinised. With the rapid expansion of the information resource, came the inevitable questions:

- Does the information resource comply with the criteria of quality web-based information resources?
- To what extent do teachers use and value the information resource?

To find answers for these questions, a variety of data collection methodologies were applied:

- An online evaluation form was added to the web site

- All correspondence (e-mail) to the webmaster of the information resource was kept
- A hit counter was added to the web site
- A critical evaluation of the information resource by an experienced colleague was done (peer review)

3.2.3.1 Data collection instruments in Cycle Three

1. Evaluation form

The design and maintenance of a web-based information resource asks for feedback and evaluation by the target group. To achieve this, an online evaluation form (Addendum C) was added to the site to provide opportunity for feedback from visitors. The evaluation form is in the form of a tick-box and asks a few yes/no-questions. There is also a text box for short feedback. The function of this evaluation form is to get direct feedback from visitors to the information resource.

2. E-mail

All correspondence with the webmaster of the information resource was kept. It was printed and filed for later reference. Direct correspondence allows for interaction with the real users of the information resource. Recording the e-mails can indicate trends in feedback, questions, problems or specific requests from the users of the resource.

3. Hit counter

A hit counter is an indicator on a web page that graphically displays the number of previous users that have accessed the page. During June 2000 a hit counter from *Absolute Statistics* was added to the home page. Absol Stats renders a free service for non-profit web sites to keep detailed statistics of visits to the web page. Since the server on which the *Goudmyn* was run, was terminated in March 2002, Absol Stats' data indicates only visits from June 2000 to March 2002. During the first months of 2002 the website was moved to a new URL because of transitions in the Higher Education[1]. A hit counter was added to the resource on 11 June 2002.

[1] The former Onderwyskollege van Pretoria (College of Education) was incorporated into the Faculty of Education of the University of Pretoria.

For the purposes of this study the average monthly visits to the information resource was recorded to try to establish to what extent the resource is being utilised.

4. Peer review

The function of peer review is to obtain an 'informed' opinion from a reliable source. A colleague with 22 years experience in training Afrikaans language teachers was asked to review the web-based information resource critically. He is professor M.J. Kühn, professor in Afrikaans and English Method at the University of Pretoria. He has also specialised in computer-integrated language teaching. An evaluation by a professional with knowledge, not only of the Afrikaans language teacher's profession, but also of educational technology, can add to the credibility of the evaluation. Such an evaluation can point out the strengths and weaknesses of the information resource.

The criteria for quality web-based information resources according to Table 2.2 in Chapter 2 were used to guide the peer review of the resource.

3.2.3.2 Data analysis in Cycle Three

Cycle Three evolved into a multi-method approach to obtain valid data. The data from various sources were used to evaluate the quality of the information resource, as well as the levels of utilisation of the resource, especially by the intended target population.

The data from the online evaluation form were recorded on an Excel spreadsheet. E-mails received were recorded and categorised. Statistics on the average monthly visits to the information resource were kept. The peer review gives a detailed evaluation of the design and content of the *Goudmyn*.

3.3 Limitations, validity and reliability of the study

It was decided – for validity's sake – to use a multi-method approach of data collection. The data for this study comes from the following different data collection instruments:

- A questionnaire completed by Afrikaans L1 teachers

- Focus group discussions with Afrikaans L1 teachers
- A hit counter on the subject-specific web site for Afrikaans L1 teachers
- A feed-back form on the web site
- All correspondence to the webmaster
- A critical peer review of the information resource.

The empirical research component of this study has obvious limitations. The questionnaire was completed by only a small sample of 78 participants who were not representative of the total population of Afrikaans language teachers. The teachers who took part in this study, teach at both primary and secondary schools, primarily in Gauteng. As the seminar was held at the University of Pretoria, most teachers came from schools in Pretoria and surrounding areas. Only Afrikaans L1 teachers were represented in the sample. Afrikaans L2 or L3 teachers were not included. It is therefore not possible to generalise these findings. They will merely be used to indicate a trend.

Table 3.1 gives an indication of how the various data collection methodologies supported each other's finding concerning the main issues of the empirical research component of this study:

Table 3.1: Sources of data for the study

Audit of information resources for Afrikaans L1 teachers	Web search engines Library visits Questionnaire
Information needs analysis of Afrikaans L1 teachers	Questionnaire Focus group discussions E-mail Online evaluation form
Utilisation of information resources by Afrikaans L1 teachers	Questionnaire Focus group discussions E-mail Online evaluation form Hit counter

Evaluation of information resource	E-mail Hit counter Peer review

The findings from the different sources of data support each other. This adds to the reliability of the research findings. Chapter 4 deals with the research findings in more detail.