

## CHAPTER FIVE: INTERPRETATION OF THE DATA

### 5.1 INTRODUCTION

The purpose of this study is to investigate the information needs and information-seeking patterns of secondary level geography teachers in Lesotho with regard to their teaching role in order to guide the design and implementation of an information service for these teachers. Data were collected to address the principal research question and sub-questions for this study that were posed in Chapter One (section 1.2).

This chapter interprets the qualitative and quantitative analysis of the data presented in Chapter Four. It focuses on addressing the study's principal question and research questions and bringing these in line with the subject literature. Qualitative data were collected through focus group discussions with in-service geography teachers, interviews with relevant officials from institutions directly involved in secondary geography education and partial observations of school libraries. Quantitative data were collected through questionnaires administered to prospective geography teachers. This study used the Leckie *et al* (1996) model of the information-seeking of professionals as its theoretical framework. Therefore, the interpretation of the data is not only guided by the study's research questions, but also by this model. Chapter Four was a broad presentation of the data from all the participants. This chapter not only interprets the data, but also focuses on addressing the study's research questions. Based on these research questions, the chapter has been organised into the following subheadings:

- The information needs of secondary level geography teachers in Lesotho.
- The secondary level geography teachers' information-seeking patterns.
- The information sources used by these teachers.
- The information sources available and accessible in the schools.
- Information communication channels used by these teachers.
- Recommendations on an information service for secondary level geography teachers in Lesotho.

Some of the information presented in Chapter Four is briefly repeated when considered necessary to contextualise the interpretations.

## **5.2 WHAT IS THE WORKING CONTEXT OF SECONDARY LEVEL GEOGRAPHY TEACHERS IN LESOTHO?**

According to Leckie *et al* (1996:179), in order to investigate the information-seeking behaviour of professionals, the broader working context in which professionals' practice is conducted must be closely examined and understood. This is also supported by Baker (2004), Johnson (2003) and Niedźwiedzka (2003). Hence this study tried to understand the working context of teachers participating in this study. Chapter Two (section 2.2.2) and Chapter Four (section 4.2.2) explained the interpretation of context in this study, namely that it focuses on the school environment, including its location in terms of different administrative districts of Lesotho, and whether it is in a rural or urban setting, or in the highlands or lowlands region (all outlined in Chapter Four, section 4.2.2). However, considering the interpretation in Chapter Two (section 2.2.2), the working context of teachers participating in this study also includes the following points:

- The broader work context of professionals, such as the socio-politico and economic conditions of their countries, their institutional settings, the availability of infrastructure for information service and information resources.
- The nature of the work, which might be scientific and/or non-scientific, type of profession, its discipline (science or social science) and the diversity of its roles, associated tasks and requirements.

### **5.2.1 What is the context of Lesotho secondary level geography teachers?**

Lesotho is a developing country in Southern Africa facing challenges such as a high prevalence of HIV and AIDS, a high unemployment rate, poverty and limited information services and information infrastructure, as indicated in the Lesotho IFLA World Report (2010) and IFLA/FAIFE World Report (2007). As explained in Chapter One (section 1.1) and Chapter Four (section 4.2.2.1), schools, including teachers, are the responsibility of the Lesotho government, churches and communities. In Lesotho formal education started with missionaries who had to build schools, and later on the government intervened by paying teachers' salaries without taking over the schools. Hence most of the schools are owned by churches, followed by the community, and schools employ teachers, while the government pays their teachers' salaries. Lately there has been an increase in government schools (Ambrose, 2008; World Bank, 2005).

The work environment of Lesotho secondary teachers is marked by constraints such as lack of finances and teaching materials, lack of facilities such as libraries (Kakoma, 1999; Mafube, 2005) and overcrowding in classrooms. Where libraries exist, they have limited books that are outdated and not related to geography. ‘Over size classes and scarcities of resources coupled with lack of trained teachers has been an outstanding problem in Lesotho for a long time’ (Moloi *et al*, 2008:613). Most of the teachers who participated in this study (70%) have to teach 25-30 periods per week. A period is a 40-minute lesson in Lesotho. The average class size ranges from 40-70 learners per class. There is no single school that reported fewer than 40 learners in a class; instead the majority of the teachers reported between 50 and 60 learners. In addition, their schools have 10-15 streams<sup>5</sup>. Many streams in the schools mean there are many learners on the school premises using the limited facilities and resources of the schools. Furthermore, when one class is taken for an excursion, it means that the teachers have to plan and cater for many students in all the streams for that particular class, when compared with a school with one or two streams per class. Pattueli (2008:642) acknowledges the heavy teaching loads of teachers and notes that owing to their intense workloads, teachers have limited time to prepare for their classes.

The length of service of the teachers who participated in the focus group discussions ranges from less than six months to 31 years. The least qualified teacher had a diploma; the majority of the teachers had bachelor’s degrees and a few had postgraduate qualifications in the form of postgraduate diplomas, honours degrees and masters’ degrees. These teachers were qualified professionals with ample geography teaching experience and they were therefore in the best position to provide accurate information pertaining to this study and also to advise on the elements essential for their information service. The participants were class teachers (48.8%; 40 out of 82), heads of department (24.4%; 20 out of 82), ordinary teachers (21.9%; 18 out of 82), deputy principals (3.7%; 3 out of 82) and principals (1.2%; 1 out of 82), as explained in Chapter Four (section 4.2.1). This indicates a heavy work load, as the teachers have to teach and still take care of administrative responsibilities. It is important to appreciate and highlight that the participants in this study were qualified teachers, given that Moloi *et al* (2008:613) observe a lack of qualified teachers in Lesotho schools.

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<sup>5</sup> Lesotho secondary education takes five years and has five classes, usually referred to as Form A to E. Because of large enrolments, a class has different subclasses, e.g. Form A1, A2, etc. and these are referred to as streams.

### 5.2.2 The nature of work of secondary level geography teachers

Baker (2004:11) observes that some professionals do a traditional type of work in an institutional setting where information in various formats can be accessed easily. The teachers in this study work in a similar institutional setting even though, as pointed out in Chapter One (section 1.1) and confirmed by data in Chapter Four (sections 4.2.5.1), information is not easily accessible. The nature of the work of secondary geography teachers in Lesotho is not clear in terms of whether it is considered to be related to science or social sciences, given that in schools, geography resorts under social science, while in the curriculum document it is clustered with the sciences. The use of colleagues in agriculture, sciences and development studies, as well as farmers and miners in the communities, by the in-service teachers in this study is an indication of a multidisciplinary subject. This is in line with an observation that geography is multifaceted and multidimensional, spanning other disciplines such as the humanities, natural sciences and social sciences (Alkis, 2009; Broek *et al*, 1980; Hall *et al*, 1991; Sharma & Elbow, 2000).

### 5.2.3 The teachers' roles and associated tasks

According to Leckie *et al* (1996:181), professionals may have work roles such as service provider, administrator/manager, researcher, educator and student. This is also affirmed by Baker (2004) and Wilkinson (2001), even though they indicate different roles. Kirby and Bogotch (1996) mention two roles for teachers: an information disseminator/provider role (involving acquisition and distribution of information) and resource provider role (involving provision of instructional resources for teaching and learning). Similarly, Uibu and Kikas (2008) indicate two roles for teachers: a knowledge/information disseminator role and a developer role, because teachers support development of students' physical, cognitive and social skills.

From the data (Chapter Four, section 4.2.2.4) identifying only three key work roles, the researcher's experience as a former geography teacher, the Leckie *et al* (1996) model and other literature, such as the work of Kirby and Bogotch (1996) and Uibu and Kikas (2008), the following potential work roles are noted for secondary level geography teachers in Lesotho:

- **Administrative/managerial role**, such as a class teacher, head of department, principal or deputy principal.

- **Committee role**, which may be perceived as not only administrative, but also involving social responsibility for learners in various issues such as sport, social problems, discipline and conduct, citizenry, etc.
- **Educator role** entailing training of learners to acquire and master certain skills. This requires the teachers to assess their learners, solve technical problems and participate in curriculum planning and development, as they are educators.
- **Researcher role** entailing continuous assessment of learners' progress and trying out new approaches and teaching methods in different situations in order to develop expertise and perhaps ultimately present in workshops, seminars and conferences.
- **Student role**, given that some teachers might be studying part-time or through distance learning with universities to improve their qualifications. It is evident in the data from prospective teachers (Chapter Four, Chart 4.5 and 4.6) that some of them had taught before studying at NUL. This is an indication of teachers' willingness to further their studies in order to attain higher qualifications.
- **Service provider role**, given that they provide a teaching service to their learners.
- **Information provider role** as explained by Kirby and Bogotch (1996), because they have to share and give information to colleagues and act as proxies in information-seeking.
- **Resource provider role** as explained by Uibu and Kikas (2008), which involves provision of instructional resources for teaching and learning.
- **Caregiving role** for vulnerable learners such as orphans in the schools in view of the high prevalence of HIV and AIDS in Lesotho, as well as adolescents who face challenges such as unwanted pregnancies and drug and alcohol abuse.

Considering the work roles above, the working context and environment of secondary level geography teachers in Lesotho and the need for secondary level teachers to prepare learners for employment as pointed out in Chapter One (section 1.1), once again it seems that there might be other factors whose information needs and information-seeking might be revealed by everyday life information-seeking models such as Savolainen (1995) to supplement the Leckie *et al.* (1996) model.

Leckie *et al* (1996:181) indicate that within the professionals' roles, there are embedded tasks. To corroborate this view, Vakkari (1999:824-5) affirms that a worker's job consists of tasks that are well identified by the workers, as they are primary actors. Leckie *et al* (1996:181) identify tasks such as assessment, supervising, counselling and report writing. Based on the data collected in this study, one can also include problem-solving, decision-making, reading, records management, developing personal notes, information-seeking and keeping abreast with the latest developments in geography teaching and learning, etc. It is important to highlight that the counselling task is associated with the caregiving role and social responsibility teachers have for orphans and other learners who might be facing adolescents' problems such as pregnancies or alcohol and drug abuse. The theoretical framework sheds light on identifying the work roles and the associated tasks of the in-service teachers who participated in this study because the study's data made it possible to identify the educator, administrator and committee work roles, as well as other roles interpreted and based on the researcher's experience and the literature.

It also transpired in some focus group discussions that some of these teachers are involved in other community and vocational services, such as national curriculum development and planning panels, geography teachers' associations and other professional associations such as the Lesotho Educational Research Association, church service committees, district and national sports associations and various clubs that are found in the schools, such as the Red Cross, Girl Guides, Students' Christian Movement, Boy Scouts, Spiritual Club, etc.

### **5.3 WHAT ARE THE INFORMATION NEEDS OF SECONDARY LEVEL GEOGRAPHY TEACHERS IN LESOTHO?**

This section interprets the data on information needs that were presented in Chapter Four (sections 4.2.3, 4.3.3 and 4.4.3). In order to understand the information needs of secondary level geography teachers, including the context in which they look for information, both in-service secondary level geography teachers (section 4.2.3) and prospective geography teachers (section 4.3.3) were asked to mention the topics on which they need information. The individuals, for instance teacher educators, curriculum developers, etc. who work in institutions directly involved in secondary level geography education (section 4.4.3) were also asked to indicate the information requests that secondary level geography teachers make to them. The

section also interprets the information needs' data based on the theoretical framework guiding the study.

### **5.3.1 What are geography teachers' information needs with regard to their teaching role?**

In Chapter One (section 1.2) the principal research question stipulates the teaching role, while the Leckie *et al* (1996) model mentions the educator role. The teaching role and the educator role are interpreted as one and the same role in this study. Given that this study is about teachers, the educator/teaching role is fundamental and this study's emphasis is on the information needs pertaining to this role; hence these are highlighted and discussed distinctively in this section because they address the principal research question directly.

The interpretation of the data from the in-service teachers as presented in Chapter Four (section 4.2.3) is that for the fundamental educator/teaching role, the nature of information needed is current and accurate information for the content to be delivered in class. Conroy *et al* (2000) also found that one of the information needs for European secondary school teachers was current information, mainly because things change a lot in modern times, also regarding geography.

In the interest of serving the users with their preferred information format, it was important to ascertain the information format preferences of the secondary level geography teachers in Lesotho. Therefore, they were asked to indicate their preferred information format as electronic and print. Secondary level geography teachers (both in-service and prospective) who participated in this study mostly prefer print format. Although most of the prospective teachers (89.2%; 41 out of 46) belong to the Net Generation as described by Leung (2004), Oblinger and Oblinger (2005) and Tapscott (2009), the majority of them (71.7%; 33 out of 46 in Chart 4.9) still prefer print format. The reason might be that Lesotho is a developing country with limited access to modern digital information super highways and people still lack awareness of advanced modern ICTs. The in-service geography teachers indicated that print format is convenient because it does not require any equipment to access. Moreover, 'the skills to utilise print sources are more widespread than for electronic sources' (Julien & Michels, 2000:10). In-service teachers indicated a preference for print format for personal use and audio-visual format for teaching material for abstract physical geography themes. Dias



Gasque and de Souza Costa (2003), as well as Merchant and Hepworth's (2002) studies, also found that teachers prefer information in print format.

The scope of information needed is mostly physical geography content for themes such as geology and geomorphology, plate tectonics, marine erosion, map reading, volcanism, etc. The need for information for physical geography content and similar themes was also revealed in the data from the interviews with individuals from institutions directly involved in secondary geography education in Lesotho (section 4.4.3). The scope of information needed also includes teaching methods and accompanying teaching materials such as models, maps, charts, etc. and how to motivate the learners in class. There is evidence in section 4.4.3 that the teachers need previous examination questions and their marking schemes. In section 4.3.3, prospective teachers indicate the need for information for content, teaching methods, classroom management, learners' assessment, educational policies, the syllabus, adolescence social problems and how the schools perform in national examinations. However, the prospective teachers failed to spell out the scope of content and its specific themes needed, probably because of the structured questionnaire, limited time of teaching practice and limited practical knowledge and experience of teaching geography. The nature and scope of secondary geography teachers' information needs as expressed by all the participants in this study were also noted in studies such as those reported by Conroy *et al* (2000), Lan and Chang (2002), Mundt *et al* (2006), Perrault (2007) and Shulman (1987). Rakumako and Laugksch (2010:140) also point to the key role of teachers' pedagogical knowledge and skills in their subject area; they indicate that knowledge and beliefs regarding pedagogy, students, subject matter and curriculum are related to teachers' effectiveness.

### **5.3.2 Which factors trigger the information needs of geography teachers participating in the study?**

It is evident from the Leckie *et al* (1996) model that information needs may be triggered by the professionals' roles and tasks and influenced by intervening variables such as demographics (Hargittai & Hinnant, 2006; Johnson, 1997; Taylor, 1991) and context (Courtright, 2007; Wilson, 1999). This subsection discusses the information needs triggered by the geography teacher's roles and associated tasks, except the educator/teaching role, because it was discussed in section 5.3.1.



### ***5.3.2.1 Information needs triggered by geography teachers' roles and associated tasks***

The literature (e.g. Leckie *et al*, 1996; Niedźwiedzka, 2003; Vakkari, 1999) indicates that roles imply tasks that trigger information needs. The information needs for the educator/teaching role have been succinctly presented in section 5.3.1. It is evident from the data outlined in Chapter Four (section 4.2.2.4) that teachers who participated in this study also have committee and administrative key roles with specific tasks that trigger different information needs. For instance, the disciplinary committee role involves decision-making and problem-solving that often requires information from legislation, regulations and policies. In addition to the educator/teaching role, as shown in section 5.2.1, the other roles interpreted for the geography teachers participating in this study are administrative, caregiving, committee membership, information provider, researcher, resource provider, service provider and student. These roles have various associated tasks outlined earlier and as data pointed out, most of these roles, in particular the administrative role and committee and service provider role, involve decision-making and problem-solving and may trigger information needs related to learners' family and social background, learners' talents and capabilities, adolescents' social problems such as pregnancies, drugs and alcohol abuse, school regulations and policies, educational policies and legal framework, etc. As indicated in the literature review, at a minimum the knowledge base required for teaching includes knowledge of the learners and their characteristics (Shulman, 1987:7). Therefore, it is not surprising for teachers to have information needs regarding learners' social background, talents and capabilities. The caregiving role may trigger information needs on social assistance for orphans, HIV and AIDS, grief counselling, etc.

Data revealed that the in-service teachers need information on educational policies, regulations and legislation to perform their administrative roles and disciplinary committee roles, while 58.70% of the prospective teachers mentioned that they needed this information during their teaching practice. There was no room in the questionnaire for the prospective teachers to mention the reasons for this need. Knowing more about the educational policies, regulations and legislation is not only about performing administrative roles and disciplining teachers and learners. It may also include knowing more about the curriculum standards and syllabus requirements because these are some of the things that are documented as policies. The Snyman and Heyns (2004) study identified curriculum, classroom activities and supportive study materials as matters pertaining to the information needs of Afrikaans language teachers in South Africa.

Other roles, such as information provider, resource provider, researcher and student, may involve tasks such as information-seeking, keeping abreast with the latest development in geography teaching and learning, acquisition of information and teaching resources, information giving and sharing, reading, etc. and may trigger a wide range of geography related information needs and geography pedagogy. De la Vega and Puente (2010:317) indicates that teachers not only require sources of information on the curricular areas they teach, on pedagogy, didactics and information technology, but also on issues learners face. Given the emphasis on physical geography themes by most participants (in-service teachers and interviews with officials from stakeholder institutions) it is not far-fetched to think that these roles also trigger physical geography information needs.

#### ***5.3.2.2 Information needs triggered by geography teachers' context***

Considering that context may trigger information needs (Courtright, 2007; Leckie *et al*, 1996; Wilson, 1999), this subsection discusses information needs that may be triggered by context. Pattuelli (2008) mentions pedagogical, institutional and personal dimensions of context for teachers that may trigger their information needs. These dimensions were also evident in the data collected from the secondary level geography teachers in Lesotho. The data indicate that teachers not only need to find content to deliver in class, but also have to get information about the teaching methods to use, bearing in mind the complexity of the topic and the type of learners. This is interpreted as the pedagogical dimension. Moreover, data revealed that secondary level geography teachers consult the syllabus documents, legislation, regulations and policies; this is considered as addressing the information needs related to the institutional dimension. Personal dimensions were evident when some teachers decided to consult farmers, miners or colleagues in their association, while others accessed and used the internet. This is because environment (urban, rural), age, established social networks and attitude to technology were factors that influenced the information sources that the teachers consulted.

#### ***5.3.2.3 Information needs triggered by the demographics of participants***

As indicated earlier, the Leckie *et al* (1996) model and other authors such as Hargittai and Hinnant (2006), Johnson (1997) and Taylor (1991) point out that information needs may also be triggered by demographics. This subsection discusses demographical factors of the study's participants that seem to trigger information needs.

From Chapter Four (Table 4.1) it is evident that most of the in-service geography teachers (75.61%; 62 out of 82) who participated in this study have bachelors' degrees in Arts and Education, while 12.19% (10 out of 82) of them have science and science education degrees. Similarly, Chart 4.4 shows that 56.6% (26 out of 46) and 21.7% (10 out of 46) of the prospective teachers who participated in this study are studying B Ed and BA Ed respectively, while 21.7% (10 out of 46) are studying BSc Ed. Chapter One (section 1.10) pointed to the physical and human geography knowledge disparity that secondary level geography teachers graduating from NUL may have owing to their degrees, which may be a BSc Ed, BA Ed or B Ed. This factor also transpired in one of the interviews with officials from institutions directly involved in secondary geography education in Lesotho. (See Chapter Four, section 4.4.3.) As a result, one would assume that BSc Ed graduate teachers would need human geography information, while BA Ed and B Ed graduate teachers would need physical geography information. However, all the teachers, including BSc Ed graduates, expressed a dire need for physical geography information and actually indicated that physical geography is very abstract. It was noted that even though the BSc Ed teachers learn more physical geography content at NUL, they do not take a course called 'geography educator' that prepares prospective geography teachers to teach geography in schools. They study too much physical geography content that is very abstract and highly scientific, but lack the pedagogical skills to deliver it to learners. Therefore, proper geography teacher training covering relevant content and pedagogy is essential.

Leckie *et al* (1996:182) reveal demographic variables such as age, profession, specialisation, career stage and geographic location. There is no evidence in the data revealing the information needs being triggered by age, profession (type of degree in this study), career stage (number of years as a teacher) nor geographical location (urban vs. rural; lowlands vs. highland, district). The information needs the participants mentioned were the same irrespective of the age of the participants, their type of degree as discussed in the above paragraph, and their schools' district. However, these demographic variables influenced the preferences for information sources and the information-seeking patterns; seemingly they influence the information behaviour of the in-service teachers in the survey. For instance, differences are noticeable between the teachers' age and the use of the internet and the geographical location and the choice of information sources, such that the rural schools reveal a close working relationship with their communities. Career stage influenced the information-seeking in terms of where to start looking for information. These factors are discussed in

section 5.4.4. It is important to point out that there was a noticeable difference in the degree of information needs satisfaction between in-service teachers and prospective teachers who participated in the study and this is discussed in section 5.3.3.

### **5.3.3 Is the available information meeting the information needs of these teachers?**

It is the ultimate goal of this study to guide the design and implementation of an information service for secondary level geography teachers in Lesotho. Therefore, it was imperative to establish if these teachers' information needs are being satisfied by the information that is available, lest one designs and implements an information service that is not needed. As a result, the teachers were asked to indicate if the information that they have satisfies their information needs. Prabha *et al* (2007) explain the information parameters within which users operate to determine what and how much information may meet their needs. These scholars indicate that users may decide that the information will be sufficient to meet their needs after chasing and evaluating references, after identifying content that is of interest and relevance to them.

As indicated in Chapter Four (section 4.2.3.5), the in-service teachers expressed dissatisfaction with the following:

- Information that they have is mostly outdated since it is mostly in the form of books that were published some years previously. It does not satisfy them because they need current information.
- There is some shortage of information generally to compare authors' views, clarify some topics and supplement textbooks' information where necessary.

Using the Prabha *et al* (2007) model of information needs satisfaction, one deduces that the information parameter of secondary level geography teachers in Lesotho is characterised by the need for current information and a variety of information sources to compare and contrast different views.

The majority of the prospective teachers (56.52%; 26 out of 46) indicated that sometimes the information they found satisfied their needs, while 39.13% (18 out of 46) showed that the information often satisfied their needs (see Table 4.13). Comparing these two percentages, one establishes that the information needs are not always addressed by the information that is available in the schools. This could be the reason why the teachers have to go beyond the

schools' premises to seek information. This means that there is a need for improvement and delivering more appropriate, timely, current and accurate information to secondary level geography teachers; such information should, however, be relevant to their needs, covering the scope of required information as discussed in 5.2.1. For instance, it is evident from the data that such information should be more related to physical geography, especially the more abstract and complex topics, and should not only be accurate and authoritative, but also current. It is also evident that teachers need information on general problems the learners are facing.

Although it often transpired during the focus group discussions with the in-service teachers that the information in their schools is outdated and limited in quantity, on the contrary 26.09% (12 out of 46) of the prospective teachers indicated that they experienced too much information when preparing lesson plans, while 60.87% (28 out of 46) experienced an average information load and 13.04% (6 out of 46) experienced a shortage of information (see Table 4.14). This contradiction between the in-service and prospective teachers should be seen in view of the fact that in-service geography teachers are professionals in practice with some exposure to teaching a variety of topics over an extended period of time and have more knowledge and experience of teaching geography. Most of the prospective teachers have limited experience or a total lack of experience in teaching and their teaching practice lasts only about three months. During this short period they may be given topics that are simple to teach with teaching materials and information available in the schools. While the teaching practice period provides practical teaching exposure to the prospective teachers, it is too short for gaining insights into the entire geography syllabus and its demands.

#### **5.4 WHAT ARE THE INFORMATION-SEEKING PATTERNS OF SECONDARY LEVEL GEOGRAPHY TEACHERS IN LESOTHO?**

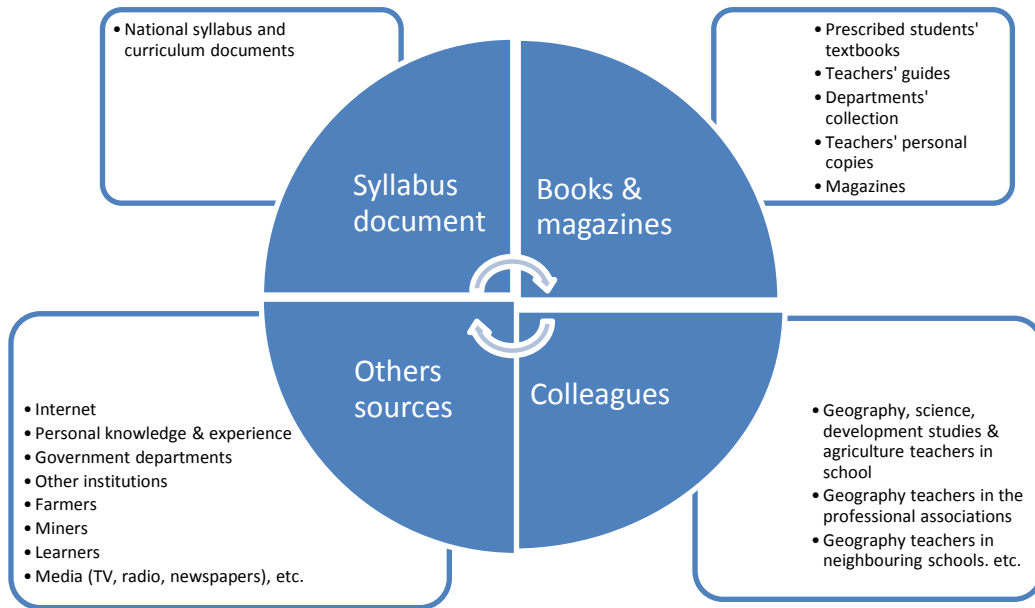
This section interprets the data on information-seeking patterns for secondary level geography teachers that were presented in Chapter Four (sections 4.2.4 and 4.3.4). Information-seeking is a process in which information needs are pursued, or in which problem-solving takes place in a particular context (Foster, 2004:228). The information-seeking process is initiated by a recognised need for information and a decision to act on it (Byström & Hansen, 2005:1055) and information-seeking should reflect the experiences of the information seeker (Foster, 2004:234). In this study, information-seeking is considered as

the actions that secondary level geography teachers (i.e. in-service and prospective) take to obtain the required information for teaching, following the information needs presented in Chapter Four (sections 4.2.3, 4.3.3 and 4.4.3) and interpreted in section 5.2.1. Investigating these information-seeking patterns was a process of examining ways in which the teachers find the information that they require for teaching, in particular how and where they look for such information.

Data from the in-service teachers were collected through focus group discussions, hence it is qualitative, and allowed the researcher to investigate information-seeking patterns. Data from the prospective teachers were collected through a structured questionnaire and did not permit deeper inquiry on information-seeking patterns. Hence data on information-seeking patterns from the prospective teachers and in-service teachers are presented separately.

#### **5.4.1 What are the in-service geography teachers' information-seeking patterns?**

This section interprets data on information-seeking patterns of the in-service teachers that were presented in Chapter Four (section 4.2.4). The information-seeking patterns were investigated by asking the in-service teachers how they usually find the information for teaching when they have to start a new topic in class. The results showed that the in-service teachers' pattern for the information-seeking process differs. Some teachers (mostly inexperienced) indicated that they start with the syllabus to establish all the details that need to be covered for the new topic and then move on to books. Others start with books, then consult other geography teachers, then science, agriculture and development studies teachers, if the topic is related to any of these subjects. There was some indication of using the internet, which shows that the teachers are taking advantage of information and communication technologies where available and accessible. The internet was reported to be used mostly in the urban schools, particularly by younger teachers. In addition, depending on the complexity of the topic, some of the teachers go to other neighbouring schools and/or their associations. If generalised, the findings on the information-seeking patterns of the in-service secondary level geography teachers in Lesotho for their teaching role can be interpreted as depicted in Figure 5.1 below. This is further explained in subsequent paragraphs.



**Figure 5.1: Secondary level geography teachers' information-seeking pattern**

The information-seeking patterns presented in Figure 5.1 shows that the in-service teachers' information-seeking for the educator/teaching role starts with the syllabus (particularly inexperienced teachers), then the learners' textbooks; if the information is still inadequate or conflicting, more books and magazines are consulted. This is followed by consulting colleagues in the school. Some younger teachers in the town schools use the internet, while experienced teachers consult colleagues in other schools or in their associations. Depending on the topic, the teachers in rural schools consult the miners and farmers in their communities. It is important to point out that it was found that throughout the information-seeking process, personal knowledge and experiences are used mainly:

- As a source of information to critique the information that is found;
- To guide the process of teaching; and
- To guide the information-seeking process, that is, which sources are likely to be useful, given the task in hand.

The information-seeking pattern above affirms Sánchez and Valcàrcel's (1999) study, which found that in general teachers used the students' textbooks as the principal source of reference although they also consulted magazines and other textbooks if the students' textbooks were considered to provide insufficient information or if the teachers did not agree with the information provided in the students' textbooks. Heavy reliance on books by teachers was also revealed by Nwokedi and Adah (2009). In addition, Tanni *et al's* (2008)



study reveals that teachers often start by reading the textbooks to familiarise themselves with the topic. The use of colleagues as a source of information also appears in the Leckie *et al* (1996) model, while Noh *et al* (2004:1276) mention that teachers procure teaching and learning resources by various means, such as obtaining the materials distributed by local educational institutes, exploring the internet and subscribing to magazines.

Wilson's (1999) nested or onion model of information behaviour encompasses information-seeking behaviour, which also encompasses information search behaviour and then information retrieval in such a manner that the inner rings are subsets of the outermost ring (i.e. information behaviour). Information behaviour is the broader concept comprising information-seeking, information-searching and information retrieval. In Figure 5.2 below the idea of a nested model is borrowed to depict an onion model in an order moving from specific to general.



**Figure 5.2: Secondary level geography teachers' information-seeking using the nested model**

In Figure 5.2 the onion model is used to depict information-seeking, which starts from the small inner component and expands to the next ring, depending on the complexity of the information need, until the information need is addressed. The model also reflects commitment to information-seeking among the teachers who participated in the survey to pursue various sources on different levels to find information. These data, however, do not reflect on information-searching and retrieval through actual interaction with information systems, nor does it reflect on the fact that some information needs are not recognised. It was mentioned in Chapter Two (section 2.4.1), that this study focuses on active information-seeking because it is informed by the teachers' perceptions and views on their information-seeking and focuses only on the information needs recognised by the participants.

#### **5.4.2 How do secondary level geography teachers seek information?**

This section offers a combined interpretation of the data from the in-service and prospective secondary geography teachers. Both groups were asked about their style of information-seeking, with the question presented in a manner that both groups would understand. In Chapter Two (section 2.4.1), it was mentioned that active information-seeking can be done purposely, serendipitously, collaboratively and through proxy. Moreover, these four different styles of information-seeking were explained. The results of this study show that both the in-service and the prospective secondary level geography teachers engage in the four information-seeking styles.

The data for the information-seeking styles by the prospective teachers are presented in Table 4.15 (in Chapter Four) and show that:

- Purposeful information-seeking was engaged in by 58.70%, 27 out of 46 (often) and 26.09%, 12 out of 46 (sometimes).
- Serendipitous information-seeking was engaged in by 15.22%, 7 out of 46 (often) and 60.87%, 28 out of 46 (sometimes).
- Collaborative information-seeking was engaged in by 45.65%, 21 out of 46 (often) and 39.13%, 18 out of 46 (sometimes).
- Information-seeking through proxy was engaged in by 21.74%, 10 out of 46 (often) and 45.65%, 21 out of 46 (sometimes).

The data in section 4.2.4.1 show that the in-service geography teachers engage in these four information-seeking styles. For in-service teachers, qualitative responses are provided as evidence in Chapter Four (section 4.2.4.1), while for prospective teachers percentages only are given. This is because data were collected and analysed using different techniques for these groups. For instance, purposeful information-seeking is done by individuals for lesson planning. It is also done when there is a problem to be solved in the committees or tasks to be carried out to fulfil administrative roles. Serendipitous information-seeking was mentioned to be done through interaction with the media, in particular TV, radio and newspapers, to keep up to date with the latest developments. This is supported by Mundt *et al* (2006:9) when they mention that for keeping up to date with local and international affairs, mainly in the form of everyday life information-seeking, teachers use newspapers, magazines, TV, educational journals and the internet. In addition, Conroy *et al* (2000) found that the press and television are used by the teachers because they cover current affairs.

Discussing collaborative information-seeking and retrieval, Foster (2006) argues that ‘settings have emerged in which information is gathered specifically for collaborative purposes, or individuals collaborate directly or indirectly with other users to engage in seeking, searching and retrieving information’ (Foster, 2006:329). From the in-service teachers’ responses, it was established that collaborative information-seeking is done through team teaching, and the activities of the geography teachers’ associations where they prepare schemes and plans of work together, set the examination questions, including their marking schemes, and hold seminars. Therefore, the geography teachers’ associations seem to be settings in which information is gathered for collaborative purposes and where teachers collaborate for information-seeking. Deaney and Hennesey (2007) also mention collaborative efforts among secondary level geography teachers in the UK, such as collaboratively developed schemes of work and sharing of resources.

Information-seeking through a proxy, occurs when information is sought through someone else or some intermediary. Considering that Kirby and Bogotch (1996) and Uibu and Kikas (2008) indicate that teachers have the role of information provider and knowledge/information disseminator, involving acquisition and distribution of information, it is not surprising to find that the teachers (both in-service teachers and prospective ones) use other people to find information on their behalf, as shown in section 4.2.4.1 and Table 4.15 respectively. They use proxies such as the heads of departments, learners, younger teachers,

family and relatives such as children, nieces and nephews and sometimes farmers and miners in the communities. It is also not surprising to find that colleagues are often consulted because that is information-sharing and giving among professionals, as noted by Baker (2004), which might be interpreted as another form of information-seeking through proxies.

#### **5.4.3 What are the challenges that secondary level geography teachers encounter when seeking information?**

This section interprets challenges that both in-service and prospective teachers encounter when seeking information. Williams and Coles (2007a) indicate that the main barrier in information-seeking and use for teachers was limited time. Shanmugam (1999) also mentions barriers to information-seeking among educators as shortage of time, inadequate library facilities, unavailability and inaccessibility of information, and inability to locate up-to-date information. Table 4.16 shows the difficulties that prospective teachers face when seeking information. These difficulties could be summed up as lack of information sources and relevant information that could address the syllabus demands, lesson plan requirements and lack of up-to-date information, which is pertinent in teaching or in any profession. Limited time was also a difficulty that some of the prospective teachers experienced. Similarly, the in-service geography teachers expressed the challenges they faced as lack of resources such as time and money, telephones and the internet. Other challenges are the heavy teaching loads and too many learners in a class that make it difficult to find time for exhaustive information-seeking. This is coupled with a general lack of variety of information sources. A heavy workload was also pointed out by Snyman and Heyns (2004) as a factor affecting the teachers.

#### **5.4.4 What are the factors that influence information-seeking of secondary level geography teachers?**

There are factors that the teachers have to consider when selecting or seeking information; and these factors also influence their information-seeking processes. These factors have been articulated by scholars such as Mundt *et al* (2006:11) and Perrault (2007). In addition, Woodsworth and Williams II (1993:10) mention that the following factors are important to consider in the process of selecting information:

- Reliability of the source of information.
- Verifiability of the information.

- The currency of the information.
- The potential short-term and long-term useful life of the information.
- The actual versus dormant need for the information.

The in-service teachers were asked to indicate the factors that they would consider when selecting a book/document for geography teaching. The reason for this question was to inform the person who will be implementing the information service for these teachers about the factors to consider when selecting relevant information that will be disseminated to these teachers. Wu *et al's* (2005) study found that the teachers' choice of resources on the internet was determined by accuracy and currency of information, as well as the attractiveness of the web site. Shanmugam (1999) also found that information currency and relevance were very important considerations in information-seeking. Tanni *et al's* (2008) study found that when processing information, the teachers chose only the parts of a document that would be understood by their learners, so they simplified the vocabulary and reduced and synthesised information. Lundh's (2005) study indicates that it was considered more important to find material that is useful in classroom situations than finding what is scientific. In essence, the most important criterion for material selection is its applicability in the classrooms.

The teachers who participated in this study indicated that they considered the following factors when selecting books/documents for teaching geography:

- The contents should address the syllabus.
- The language should be appropriate for the level of the learners.
- Colourful illustrations in the form of diagrams, photos and maps are important.
- The learners' activities are considered because they enhance understanding of the concepts and principles.
- The date of publication is crucial because current information is considered to be vital in geography.

The need for the contents to address the syllabus concerns the relevance of information to teaching requirements. This is affirmed by Shanmugam (1999). The notion of considering the language level of the learners is also supported by Tanni *et al* (2008), and colourful illustrations to enhance understanding and to draw learners' attention are mentioned by Wu *et al* (2005). Lundh (2005) emphasises applicability of the information to the classroom

situation. Information can be applicable in the classroom if it is relevant, uses language that is appropriate for the learners, is associated with activities that will enhance learning and also has colourful illustrations; these are also the factors that the secondary level geography teachers in Lesotho mentioned. Currency of information was expressed under information needs and it is also indicated as a factor to consider when selecting information for teaching. This is also acknowledged by Shanmugam (1999) and Wu *et al* (2005).

As mentioned in Chapter Two (section 2.4.2), information-seeking may be influenced by different factors, such as the personality of the information seeker, the urgency of the information need, the context or situation of the information seeker and the availability of information sources (Heinström, 2005:229). In addition, information-seeking is affected by the sources of information and awareness of information (Leckie *et al*, 1996). Since this study is guided by the Leckie *et al* (1996) information-seeking model, it considered age and career stage, which are aligned with teaching experience, as well as other experience relevant to their work, geographic location of the schools where the teachers work and the teachers' qualifications. Although it was established in the subject literature that gender is a variable for the demographics, it was not considered in this study because the study focuses on teachers as professionals and it is envisaged that the professionals' gender may not be important in this case. However, in the focus groups it was evident that more female teachers reported the use of TV compared to male teachers, while more male teachers reported using newspapers than female teachers. This is an observation worthy of reporting, even though the initial intention was not to consider gender as a variable.

The results of this study show that information-seeking (but not the information needs as such; see section 5.3.2.3) among the in-service teachers is influenced by age, teaching experience and location of the schools. For instance, most of the younger teachers, who are also inexperienced, who are teaching in urban schools indicated that they use the internet. To some, the internet is available in their schools, while others mentioned that they go to internet cafés to access the internet in order to get information for their teaching. In most cases, the older teachers with long teaching experience indicated that they had never had any guidance or training on how to use the internet and various electronic resources; some also mentioned that they had never used the internet. They mentioned that they depend on the younger teachers as well as younger family members such as their children, nieces and nephews to find information on the internet on their behalf. However, they tend to use colleagues in their

schools, in neighbouring schools and even in their association more often when compared with the inexperienced, younger teachers. The reason could be that the experienced teachers have established networks and know more places where they can find information and they have less confidence in their ability to seek information using modern ICTs such as the internet. The researcher also found that the rural schools' teachers tended to consult the farmers and miners in their communities on topics related to farming and mining. Sometimes the farmers and miners are even invited to be resource persons in their classes. Yet, there was no mention of this in the urban schools. The reason could be that there are better working relations between the rural schools and their communities. In addition, there are more farmers and miners available in the rural areas compared to the urban areas.

There was no evidence that qualification has any influence on information-seeking. One would think that the teachers with a science education background would be seeking more human geography related information, while the teachers with a humanities background would be seeking more physical geography related information in view of their NUL training background. However, it transpired during all the focus group meetings that the teachers need more physical geography information and teaching material irrespective of their qualification. The reason could be the one mentioned by INT 4 (section 4.4.3) that the science education students at NUL do not take the geography educator course and therefore lack the pedagogy for the subject. In addition, the physical geography content that they study is too abstract for the learners, making it difficult to apply in the classroom. As noted earlier, it is important for teachers to find information that is applicable in the classroom.

Considering the theoretical framework guiding this study, one would like to summarise that Leckie *et al* (1996:185) point out that knowledge of various information sources and the perceptions formed about information retrieved play a crucial role in the overall process of information-seeking. These scholars argue that knowledge and awareness of information, in particular content, can determine the course of information-seeking. It is mentioned that professionals will consult sources with which they are familiar and have had prior success in using to satisfy an earlier information need. Professionals consult sources that they trust will provide accurate information in a preferred format. Furthermore, professionals use sources that they know will deliver the information on time and are accessible in terms of distance and cost. It transpired from the teachers that they use sources with which they are familiar and that they trust will provide accurate information. For instance, the use of colleagues in



other schools and in the associations occurs through established networks used mostly by the experienced, older teachers. These networks are trusted and respected because these teachers have used them over time and they are aware of their reputation (Leckie *et al*, 1996).

## **5.5 WHICH INFORMATION SOURCES DO SECONDARY LEVEL GEOGRAPHY TEACHERS MOSTLY USE?**

The Leckie *et al* (1996) information-seeking model for professionals that is guiding this study articulates that the sources of information used by professionals are colleagues, librarians, handbooks, journals and their own personal knowledge and experience that they gained while training for their profession. It transpired that the in-service teachers mostly use colleagues, personal knowledge and experience, books, media and resource persons such as farmers, miners and institutions that have information related to geography. The internet was reported to be used by younger teachers in the town schools. There was very little indication that journals are used by these teachers. In fact, only two focus groups reported having journals and using them. The rest of these teachers indicated that they did not have access to journals. They last used journals when they were at university. It was also noted that the younger teachers who indicated that they used the internet were not yet fully taking advantage of free web journals.

Landrum *et al*'s (2002) study found that teachers generally rated colleagues, workshops and in-service presentations as accessible, trustworthy and usable sources of information and professional journals were found to be less trustworthy, less usable, and less accessible when compared with information from colleagues. In this study, it was found that the in-service teachers trusted their colleagues and their associations for information. It transpired that the in-service teachers only attend the workshops that are organised by their associations because it has been a long time since the MOET organised any workshops for them. It was evident that the teachers' associations were active in organising workshops and seminars and thus provided and facilitated a lot of information dissemination and sharing. However, the associations do not document the activities of these events into reports, which are deemed as important sources of information that could be consulted by teachers, because of lack of advanced documenting and report-writing skills. It is the researcher's opinion that in a situation of shortage of information sources, all efforts must be made to document things properly by producing reports, as they are potential sources of information. Information can

be made available in different forms and formats, and can be accessed through different means. The next section discusses internal and external sources of information.

### **5.5.1 Internal vs. external information sources**

Krikelas (1983:17) refers to internal and external information sources in organisations and within and outside of people. Hence there is tacit knowledge and explicit knowledge; people tend to use both internal and external information sources. The results show that the secondary level geography teachers, both in-service and prospective, use both internal and external information sources, given that 67.39% (31 out of 46) of the prospective teachers mentioned having sought information both in and outside their teaching practice schools (see Table 4.12). In addition, the in-service teachers indicated that they used their books, colleagues in their schools, and colleagues in neighbouring schools as well as in their associations. There is also evidence of reliance on personal knowledge and experience, which is an internal source of information. They also mentioned that they used government ministries and other institutions, including farmers and miners in the communities, and internet cafés. This has also been confirmed in interviews with people in the institutions directly involved in secondary geography education in Lesotho. It is thus clear that internal and external sources of information are used. Williams and Coles (2007a) found that teachers tend to rely on readily available resources, particularly those available in the school. On the contrary, the teachers who participated in this study indicated that they made every effort to find information because they go even beyond their schools' premises. The main reason for this could be awareness of lack of sources in their schools.

Byström and Järvelin (1995:196) refer to people, experts, literature and official documents as information sources. The in-service teachers indicated that they used farmers and miners who are experts. The literature they claimed to use is mostly in the form of books: the syllabus, policies, regulations and legislation used in teaching and disciplinary cases are official documents and have been mentioned as some of the information sources consulted. The individuals who were interviewed from the institutions directly involved in secondary geography education are not only external sources of information, but also experts. They are also consulted for information; this was mentioned by the in-service geography teachers and confirmed by individuals who were interviewed. This is a clear indication of the use of external experts as information sources.

As indicated in Table 4.17, the prospective teachers indicated that they mostly used the following information sources:

- Books were used by 91.31% (76.09% often and 15.22% sometimes).
- Teachers at the schools were used by 89.13% (42 out of 46), which included 43.48% indicating often and 45.65% indicating sometimes.
- Personal knowledge and experience were used by 84.78% (41 out of 46), which included 45.65% indicating often and 39.13% indicating sometimes.
- Personal friends/family/relatives were used by 63.04% (29 out of 46), which included 17.39% indicating often and 45.65% indicating sometimes.
- Media were used by 54.35% (25 out of 46), which included 17.39% indicating often and 36.96% indicating sometimes.
- School libraries were used by 47.82% (22 out of 46), which included 30.43% indicating often and 17.39% indicating sometimes.

The above bullet points confirm once again the use of external and internal information sources. It is evident that both in-service and prospective geography teachers often use books, colleagues in the form of teachers and friends, personal knowledge and experience and media. Although the in-service teachers indicated that they used some government ministries, institutions and their associations, most of the prospective teachers indicated that they never used these sources during their teaching practice (see Table 4.17). In addition, while 47.82% (22 out of 46) of the prospective teachers mentioned having used school libraries during their teaching practice, the majority of the in-service teachers hardly ever used their libraries, as shown in 4.2.5.2. (School libraries are discussed in the next section.) The differences in the use of information sources by the in-service teachers and the prospective teachers could be attributed to the short span of the teaching practice period, lack of teaching experience and knowledge of institutions that could provide information on the part of the prospective teachers. It seems that there is over-dependency on internal information sources by prospective teachers during their teaching practice, while in-service teachers tend to use internal sources with some over-dependency on external sources.

### 5.5.2 School libraries and journals

Section 4.2.5.2 shows that the in-service teachers hardly use libraries and journals. Journals are not available in most schools, and where they exist they are outdated. Some schools do not have school libraries and neither do they have any public library in their vicinity. Moreover, where school libraries exist, the teachers mentioned that the libraries are manned by unskilled people who are incompetent to deliver the desired information service. This observation was also noted in Chapter Four (section 4.2.5.2). Furthermore, they are stocked with outdated information that is not even related to geography. The situation of school libraries found in this study confirms Kakoma's (1999) study, which found that most of the secondary schools in Lesotho do not have school libraries. Where libraries exist, they are manned by people with no qualification in librarianship, they do not receive adequate financial support and the opening hours are not consistent owing to shortage of staff and lack of guiding policies. O'Connor (2009:280) notes that school librarians have perpetually been in short supply because school librarians had less access to advanced education, both for socio-economic reasons and because of the availability of fewer library training programmes in the past. In the same vein, Mafube (2005) indicates lack of school libraries and information resources in the secondary education sector in Lesotho.

The poor situation of school libraries in Lesotho seems to be common in other African countries as well. Adeyemi (2008:96) reviews literature on school libraries' situation in several African countries such as Ghana, Kenya, Namibia, Nigeria, South Africa and Sudan. It is indicated that in South Africa, while some schools have excellent library facilities, others have nothing that can be vaguely called a library. There is low level of school library provision in township schools (Dubazana & Karlsson, 2006:8) and most schools have either no library or defunct library programmes (Zinn, 2006:21). Adeyemi's (2008) literature review indicates the situation of school libraries in Africa as characterised by:

- Untrained personnel who serve in libraries on a part-time basis because they are full-time teachers;
  - Inadequacies in funding and personnel;
  - Educational authorities' failure to address the needs of school libraries;
  - General lack of school libraries in many schools;
  - Poor standards of African schools' libraries when compared with developed countries;
- and

- Lack of coherent policies on school libraries.

Adeyemi's (2008) views have also been raised by in-service teachers who participated in this study as outlined in Chapter Four (section 4.2.5.2). These views are also corroborated by several studies in KwaZulu-Natal, South Africa such as Du Toit's (2009) study on school library policy and its feasibility for implementation in the province, Dubazana and Hoskins's (2011) study on promoting equitable access to school libraries, Dubazana and Karlsson's (2006) study on integration of the school library into the curriculum, Hoskins's (2006) study on libraries and teacher-librarians, Tiemensma's (2006) study on school libraries in support of voluntary reading, and Zinn (2006). Moreover, the partial observations of school libraries' that were discussed in Chapter Four (section 4.2.2.3) also show similar issues noted by Adeyemi (2008). For instance, all the school libraries that were observed in this study are staffed by people with no qualification in library and information science. Five school libraries that were observed are serviced by full-time English language teachers, while two are serviced by full-time school office clerks who serve in the library on a part-time basis. Nonetheless, ten school libraries observed were serviced by full-time staff. None of the libraries had any budget.

### **5.5.3 Information sources needed by in-service teachers**

The in-service teachers were asked about information sources that were not available in their schools but that they felt they needed. They mentioned the internet, maps, charts, models and videos as the resources that they really needed. The teachers regard the internet as a source of current information that is needed by both the teachers and the learners. Great emphasis was placed on the internet as though it is perceived to be a solution to many information related problems in the schools. A similar perception about the internet among in-service secondary level geography teachers was noted by Perrault (2007:3) who cited that many teachers are convinced that the internet can help with instructional planning and the creation of learning activities for learners. Perrault (2007) further indicates that even though the internet has the potential to offer resources the teachers seek, some teachers' experience with the internet is that it is time-consuming. They express frustration with the quality of the results, while others are overwhelmed when a search yields thousands of results. In addition, the teachers may also not access the information they want adequately because they lack the necessary skills to use the internet efficiently and effectively. Most of the experienced in-service teachers (who are

older) indicated that they had never used the internet; neither had they ever had any guidance in using electronic databases. It is obvious that they do not have any internet navigational skills. Therefore, it is important that the availability of the internet is assured, along with training for its effective use.

As pointed out earlier, the in-service teachers need maps, charts, models and videos and regard them as teaching materials or aids that will enhance understanding of abstract physical geography among the learners. There was a clear indication that it is frustrating to teach some physical geography topics without these sources. The need for the internet, models and videos was also mentioned in most of the individual interviews that were conducted with stakeholders (see section 4.4.5). One notes that Borgman *et al* (2005:651) also identified maps, photography, census data and images as primary sources of information for geography educators.

## **5.6 WHICH INFORMATION SOURCES ARE AVAILABLE AND ACCESSIBLE AT SCHOOLS PARTICIPATING IN THE SURVEY?**

Information sources have to be available and accessible in order to be used. Since the ultimate aim of this study is to guide the design and implementation of an information service for secondary level geography teachers, it was important to establish the information sources that are currently available in the schools so that the information service that is being designed can incorporate the information sources that already exist in the schools in order to avoid 'reinventing the wheel' and duplication of efforts. Both the in-service teachers and the prospective teachers were asked to indicate the information sources that were available in the schools, whether the sources provided sufficient information and whether they had experienced restrictions when using the sources.

The data on the availability and accessibility of information in the schools are presented in section 4.2.5.1 and Table 4.10, as collected from the in-service and prospective geography teachers respectively. In these data, 60.87% (28 out of 46) of the prospective teachers indicated that their teaching practice schools had libraries, 28.26% (13 out of 46) felt that the school libraries provided them with sufficient information and 43.48% (20 out of 46) experienced no restrictions in using the library. However, of the 28 focus groups that were held with the in-service teachers, only two focus groups expressed that they were not only

satisfied with the information from their libraries, but also experienced no restrictions in accessing the libraries. In the rest of the focus groups, the in-service teachers stated that their libraries had outdated books with no relevance to geography. It was evident from some of the in-service geography teachers' comments that accessibility and availability of information on the school premises present a problem. This is because although some schools have school libraries, the teachers do not have access to them owing to lack of personnel to open the library at convenient hours. Similarly, a few schools have access to the internet, but it is in the school offices and computer laboratories, with none in the staff room. In Lesotho schools, the office is used by the principal, deputy principal and secretary; the teachers use the staff room. Hence the teachers feel that facilities that are in the office are for the occupants of the offices, not for them. They believe that the internet would be accessible if it was available in the staff room. It was mentioned that the computer laboratory is intended for the practical training of learners who take computer science as a subject, thus making it less accessible for use by the teachers. De la Vega and Puente (2010:312) indicate that the availability of printed, audio-visual and electronic information to the teachers is limited.

### **5.6.1 Awareness of information among geography teachers in the survey**

Considering that this study is guided by a theoretical framework of the Leckie *et al* (1996) model, it is important to highlight the component of awareness of information among the secondary level geography teachers who participated in this study. According to Leckie *et al* (1996:184-185), awareness of information concerns direct or indirect knowledge of various information sources and the perceptions formed about them. Table 5.1 links the factors comprising awareness of information from Leckie *et al* (1996) to the geography teachers in the survey.



**Table 5.1: Awareness of information among geography teachers in the survey reflected in the Leckie *et al* (1996) model**

Leckie <i>et al</i> (1996) awareness of information	Link to the geography teachers in the survey
Familiarity and prior success in using the information source	The use of farmers and miners in the communities in most rural schools that participated in the study is an indication that these teachers are familiar with the farmers and miners and aware of their willingness to offer information.
Trustworthiness (how reliable and helpful the information is)	The community (farmers and miners), as well as colleagues in other subjects, neighbouring schools and the professionals' association are trusted and considered reliable and helpful.
Packaging (convenience and usefulness)	Preference for print format, as it is considered convenient and useful, while the audio-visual format in the form of videos is helpful for teaching abstract physical geography topics.
Timeliness (found when needed)	The frequent use of information supplied by colleagues is an indication that colleagues are found whenever needed.
Cost (relatively cost-effective)	It is relatively cost-effective to use information in the vicinity. But owing to the complexity of information needs and lack of information sources in the schools, teachers go even beyond school premises to seek information.
Quality (level of detail, accuracy, etc.)	Certain books, particularly the textbooks prescribed during their teacher training at university, are considered to be detailed and accurate. However, textbooks for JC level are considered to be of poor quality because of typographical errors, lack of detail in articulating concepts and conflicting information.
Accessibility (relative ease of access)	Teachers tend to use information sources that are accessible to them; however, they still go out to seek more information, depending on the complexity of the need and their level of determination to find the information needed.

Table 5.1 focuses on information awareness component of the Leckie *et al* (1996) model based on the results of the study particularly on the in-service teachers. The next section focuses on the outcomes and feedback component of this model still based on the results of the study.

### **5.6.2 Outcomes and feedback component of the Leckie *et al* (1996) model in the survey**

The last component of the Leckie *et al* model (1996) is about the outcome and feedback of information-seeking, which is described as the results of the information-seeking process (Leckie *et al*, 1996:187) and this includes completing tasks, meeting information needs and realising the operational benefits of achieving professional development goals (Leckie *et al*, 1996:187).

The outcome of and feedback on information-seeking for teachers studied depend on the roles and tasks that led to the need for information. As shown in Figure 5.3 and discussed in section 5.3.1, teachers show a high level of commitment to information-seeking; they go to great lengths to find information even beyond their premises, although they work under difficult circumstances. For instance, the educator role involves teaching. The outcome of information-seeking in the teaching situation is the recognition of the end of a topic. This means that the essential elements of the topic as required by the syllabus have been clearly communicated to the learners. This is usually identified through testing and evaluation of the learners at the end of the topic. It should be understood that one topic is covered over a number of lessons. During marking, the teacher gets some feedback on the outcome. The desired outcome is that the learners have learned about the topic, acquired the knowledge and mastered the skills associated with the topic. Some feedback is found immediately at the end of the lesson because the teachers may evaluate the lesson by asking a few questions to assess if the learners grasped the lesson objectives.

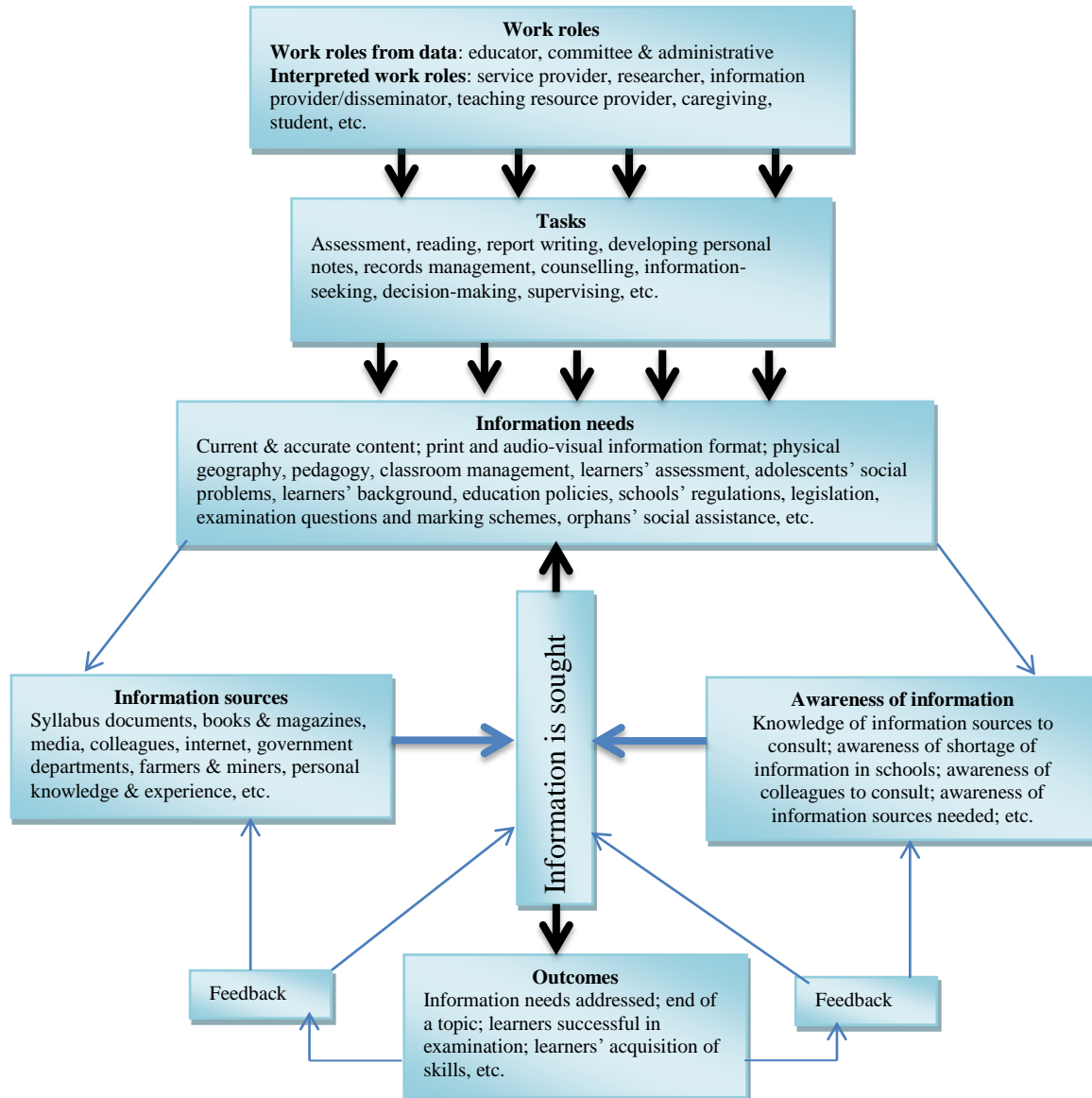
Based on the researcher's experience as a former geography teacher, the outcome of information-seeking might be the final result at the end of the national examinations. This is considered as important feedback on whether the information-seeking and information delivery has been successful. If the outcome is desirable, it means that the learners passed well. Therefore, the teacher knows that his/her information-seeking was desirable in the sense that the right information was obtained and was delivered appropriately to the learners. However, it should be noted that there are many factors that affect the performance of the learners in examinations.

The administrative role and committee role usually require information when there is a problem to be solved and/or when there is a need to address some issues. For instance, if one is in the orphans' committee, then one has to identify the orphans and look for organisations that offer social assistance to orphans. When the orphans receive social assistance, information-seeking might end. If there is a teacher or student who requires to be disciplined, information on the procedures will be sought and when the disciplinary action has been taken, information-seeking ends. However, in most situations the end might only be temporary since information-seeking resumes when similar situations recur.

In the model that is guiding this study, the outcomes are the results of the information-seeking process. It may be considered as the end result of the work related requirements of specified work roles and tasks (Leckie *et al*, 1996:187). The optimal outcome is when the information need is met and the professional has accomplished his/her task. However, it is possible that the outcome does not meet the information need such that the task is not accomplished and therefore further information-seeking is pursued. This has been outlined as the feedback loop on the model (Leckie *et al*, 1996:187). The teachers' information-seeking process starts with the syllabus, then books (textbooks and teacher copies). If the information is not enough or unsatisfactory, more sources, such as colleagues, additional books and the internet are consulted. There is evidence that the teachers make concerted efforts to find information. They only rest when they feel they have some information to accomplish the tasks. This contradicts Zipf's principle of least effort, as discussed by Case (2005) and Hertzum (2002). The reason could be that secondary level geography teachers are generally aware of the inefficiencies of their information sources.

Baker (2004:11) indicates that the Leckie *et al* (1996) model does not address information-giving in the information-seeking process of professionals, and yet some professionals have the task of sharing and giving information. There was some evidence of information-sharing and -giving in the study. This is done through the work of the professional associations where planning of the work is done together. Also, when colleagues exchange information and consult one another, it can be regarded as information-sharing and -giving. In the associations, common internal examinations are prepared, mainly the questions and the marking schemes. In the schools, there is evidence of information-giving and sharing in meetings, informal chats with colleagues and team teaching. Some inexperienced teachers actually share notes and compile departmental files.

The Leckie *et al* (1996) model was helpful in addressing the research questions for this study. The work roles and associated tasks of the secondary level geography teachers, the characteristics of the information needs they mentioned, and the information-seeking patterns of the teachers, including the challenges that affect their information-seeking as well as the information sources that they use, were identified. Figure 5.3 presents the data interpretation on the Leckie *et al* (1996) model.



**Figure 5.3: Data interpretation on the Leckie *et al* (1996) model.**

## **5.7 WHICH INFORMATION COMMUNICATION CHANNELS ARE PREFERRED BY SECONDARY LEVEL GEOGRAPHY TEACHERS?**

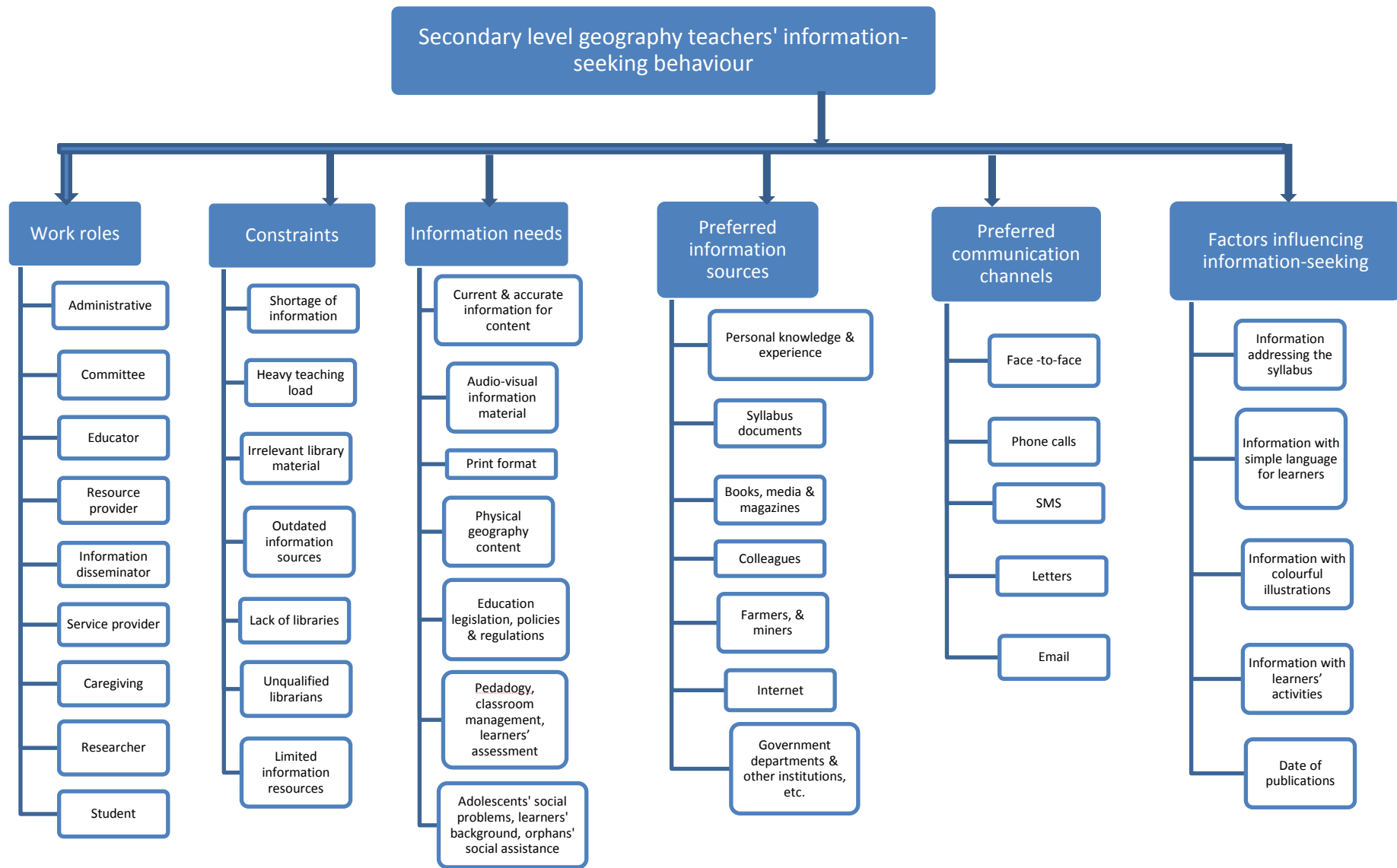
There are several channels through which information may be communicated or disseminated. Dewhirst (1971:306) found that interpersonal communication, that is, face-to-face conversations, telephone calls and meetings with colleagues in the same organisation, proves to be the most efficient means of finding or communicating useful information. Similarly, Listwon and Sen (2009) found that word-of-mouth was the most successful means of disseminating information in promoting or marketing library services. The results of this study show that the in-service teachers mostly use word-of-mouth, telephones and SMS to

communicate, depending on the distance, amount of information, the nature of information and the urgency of the information.

As shown in Table 4.18, the prospective teachers (95.65%; 44 out of 46, that is, 78.26% often and 17.39% sometimes) used face-to-face communication during their teaching practice. This was followed by cell-phones 45.65% (21 out of 46, that is, 15.22% often and 30.43% sometimes). Other channels of communication were used by very few prospective teachers, while some were never used. In addition, it emerged from the interviews that the teachers communicate face-to-face and by telephone and cell-phone.

The above results confirm Dewhirst (1971) and Listwon and Sen's (2009) studies that indicate that face-to-face communication is quite useful. One must also point out that the individuals representing stakeholder institutions that were interviewed also indicated that secondary level geography teachers communicate with them interpersonally or through cell-phones and telephones. Therefore, the data from all the groups of participants in this study confirm that face-to-face communication and phones are the preferred channels. Letters are used for official invitations when there are events such as workshops. Email and internet-based communication, although preferred and acknowledged to make communication easier and faster; can still not be accessed by the majority of the teachers and it is therefore not used extensively.

In summary, the feedback from secondary level geography teachers (in-service and prospective) who participated in the survey is reflected in Figure 5.4. The diagram includes the work roles, information needs, constraints, preferred information sources and communication channels and the factors influencing information-seeking.



**Figure: 5.4: Secondary level geography teachers' information needs and information-seeking patterns**

The results of this study are reflected in Figure 5.4 as a summary of the information needs, information-seeking, information sources, communication channels, work roles and information constraints of secondary level geography teachers in Lesotho. It captures the key issues from the discussion in Chapter Four (sections 4.2 – 4.4) and sections 5.2 – 5.6. These key issues will be considered in Chapter Six that proposes an information service model for secondary level geography teachers in Lesotho.

## **5.8 WHICH INFORMATION SERVICE CAN BE RECOMMENDED FOR SECONDARY LEVEL GEOGRAPHY TEACHERS IN LESOTHO?**

All the participants were asked to recommend an information service that would be appropriate for secondary level geography teachers in Lesotho. The participants' recommendations were analysed based on the literature, such as Madden (2008) and the RUSA guidelines (2000) and it was established that these recommendations pertained to services, resources and access.

### **5.8.1 Services**

It is evident from the data that the participants want audio-visual aids such as maps, videos, charts and models, particularly for various physical geography topics. In particular, the teachers need physical geography information, such as geology and geomorphology, landforms, plate tectonics, marine erosion, map reading, etc., as indicated by the in-service teachers and individuals from stakeholder institutions. In addition, the teachers indicated that they prefer information that is not only accurate, but current and in print format. The information should be relevant to the syllabus and appropriate for the level of their learners so that it can be used easily in the classrooms. This information should be made available in their schools for easy access and use.

### **5.8.2 ICTs and information resources**

The participants acknowledged that Lesotho is one of the countries with a developing economy and schools generally lack resources such as ICTs. It would not be possible to provide all the schools with the resources that they need. Therefore, resource-sharing among schools was suggested by the in-service geography teachers and the individuals who were interviewed. Formation of resource centres was suggested to serve a cluster of schools (see



section 4.2.6). Information resource-sharing through school-clustering was studied by Nzimande and Stilwell (2008) in South Africa. These scholars indicated other countries such as Burundi, Ethiopia, Malawi, Nigeria, Zambia and Zimbabwe where information resource-sharing through school-clustering has been used. Furthermore, the scholars reveal a school-clustering model where a well-resourced school with suitable infrastructure and facilities is identified as a nodal or hub school, such that the hub school could be clustered with eight to ten schools to converge upon it to access resources. Information resource-sharing by a cluster of schools is worth considering for Lesotho secondary level geography teachers, as there is no single school that has all the resources that these teachers need.

Although some teachers suggested the establishment of information resource centres, other teachers, particularly those in isolated rural schools, indicated that they needed geography rooms in their schools. This is because there would not be time and money to travel to a resource centre at a neighbouring school, mainly because the schools are far from each other. It was mentioned that the geography rooms would serve as laboratories for geography and they should be equipped with all the necessary teaching aids and technologies for geography teaching and learning.

Another recommendation (see section 4.4.5) is the development of a documentation centre such as the IDC of the IE at NUL. This documentation centre exists to serve the NUL community as well as in-service teachers and researchers in the field of education with information. Such a documentation centre should have internet access, videos, models, charts and other information resources that could be rented out to schools. Nwagwu and Oshiname (2009) suggest the establishment of information centres/libraries to be coupled with enhancing the users' computer literacy skills that would improve information-seeking.

The in-service and prospective teachers regard the internet as an information source for current information of various kinds and clearly indicated that schools lack access to the internet and that it should be available in all schools for use by both teachers and learners. Barker (2009:1) indicates that free web-based materials may be the only hope for teachers in poor schools, since no books may be available for what a teacher needs to teach, there may not be enough books for all the students, or the available books may be out of date. This situation described by Barker (2009) is one that the in-service teachers mentioned they were facing. Therefore, it is not surprising to find that the teachers in Lesotho indicated a dire need

for the internet to serve their information needs. According to Akengin (2008:137), use of information technologies develops critical thinking skills in geography subjects, and internet resources enable students to learn easily about countries they have never been to or know. Akengin (2008:128) points out that the use of the internet and other information technologies, particularly in the field of geography, makes abstract phenomena and concepts concrete and consequently increases the interest of the learners in the subject.

Underwood (2007:3) asserts that the growth of the information society and the networked culture in South Africa is apparent. Cell-phones are ubiquitous and easily outnumber fixed-line installations: the technology has provided telecommunication services for many communities that would, otherwise, be unlikely to be connected to a fixed-line service. The cell-phone system has permeated even some remote areas in Lesotho where telephone communication was never thought of. One realises that many people, nowadays, including secondary level geography teachers in Lesotho, have cell-phones. As a result it was recommended (see section 4.4.4) that they should take full advantage of cell-phones' potential, such that they not only use them for calls and SMS, but also for internet access so that they are not left behind in the growing information society. After all, 'mobile and other electronic delivery mechanisms make possible the availability and delivery of services and information at anytime and anywhere' (Bryson, 2006:4). In view of current reports on mobile access to information sources, such as the creation of mobile library websites, OPAC mobile and the provision of SMS library services, as suggested by Griffey (2010) and Sheikh and Tin (2010), this may be a good solution to the problems of secondary level geography teachers in Lesotho, since they already have cell-phones and are constantly on SMS. Kirschner and Selinger (2003:5) maintain that children everywhere are creating their own virtual communities through the use of new technologies. They take part in discussion groups, navigate through virtual worlds and assimilate hardware and software as if it were second nature. They are light years ahead of their parents and teachers with respect to the possibilities of information and communication technology. It is envisaged that children in Lesotho would also be far ahead of their parents and teachers. This could be the reason why some teachers use their children, nieces and nephews as proxies for searching information on the internet.

### 5.8.3 Access

The teachers expressed a lack of variety of information sources such as the internet and consequently difficulty in accessing the latest relevant information; there is also an indication that physical geography information is sometimes neither available nor accessible. They made the following recommendations:

- The library materials are outdated and therefore the government must supply more up-to-date information material regularly. It was highlighted that there is a need for books that provide current information and reflect different ideas and perspectives for teachers.
- There is a need for geography journals. Therefore, schools and/or the Lesotho government should subscribe to some journals, because journals provide current information.
- Geography teachers' workshops should be held regularly to assist the geography teachers with teaching and information literacy training.
- School libraries should be manned by competent full-time people who can take the initiative to collect and disseminate accurate and current information in time.

The next section is a discussion of the interpretation of the data that were presented in the previous sections with regard to the Leckie *et al* (1996) model.

## 5.9 KEY FACTORS TO CONSIDER FOR THE DESIGN OF AN INFORMATION SERVICE FOR SECONDARY LEVEL GEOGRAPHY TEACHERS IN LESOTHO

The following points summarise a selection of the interpretations presented in this chapter. These points are key issues that will be considered to guide suggestions for the design of an information service for secondary level geography teachers that will be dealt with in the next chapter:

- The information needs of the secondary level geography teachers in Lesotho are related to current and accurate information and for content to be delivered when teaching, as well as to cater for the other work roles of the teachers.
- The teachers need information materials in audio-visual format, e.g. maps, models, charts and videos related to physical geography topics such as geology and geomorphology (landforms and plate tectonics), marine erosion and volcanism, to name a few. Most of the teachers (in-service and prospective) prefer their information

in print format. This calls for a variety of information formats and the use of multimedia to cater for various purposes.

- The teachers also need information related to teaching methods or pedagogy, learners' assessment and social background, adolescence social problems and classroom management, as well as educational policies, regulations and legislation.
- While some prospective teachers indicated that the information they had during their teaching practice satisfied their information needs, most of the in-service teachers expressed dissatisfaction with the information that they had. The dissatisfaction was prompted by the fact that the information was mostly in the form of books that were published a long time ago. There was general lack of variety of information sources that would enable them to compare different views from books, to clarify information and to supplement the information found in the textbooks.
- The information-seeking patterns of in-service teachers is to start with the syllabus documents (this applies particularly to the inexperienced teachers), then the learners' textbooks, then other books that the teachers bought while at university or purchased through their schools, including magazines. Then they consult colleagues who are also geography teachers, science, agriculture and development studies teachers in the school. Sometimes the teachers use the internet, teachers in other schools or those in their associations, as well as some government ministries, institutions, farmers and miners. This shows variety of information sources that the study participants consult, and might mean inclusion of a variety of information sources in the proposed information service.
- The requirements of the syllabus, the language level of the learners, colourful illustrations and the date of publication are some of the key factors that in-service geography teachers use when selecting information for teaching geography.
- The teachers often seek information individually for a specific purpose. Sometimes the teachers collaborate to seek information. Collaboration is practised through team teaching, setting of common examinations and marking schemes in the schools and

associations, collection of information to compile departmental files and comparing notes and sharing ideas. Occasionally, the teachers ask other teachers, especially younger teachers and relatives, to find information on the internet on their behalf. In addition, the heads of departments are also often asked for information. The teachers also find useful information for teaching as they regularly interact with media such as TV, radio and newspapers.

- The teachers indicated limited time and lack of money and information resources as barriers to the information-seeking process.
- The sources of information that are mostly used by the secondary level geography teachers are books and colleagues.
- The schools have books, reference books, telephone lines, computers, photocopiers and school vans. There are some schools that already have facilities such as the internet, fax, TV and DVD players. A few schools also reported to have journals, even though these are donations rather than regular issues.
- Face-to-face communication, telephone and SMS are mostly used by the teachers to obtain and exchange information; letters are used mainly for official invitations to workshops, meetings, conferences, etc.
- The teachers recommend accessibility to the internet, as well as availability of geography rooms and resource centres for information-sharing, as some of the things that could improve the secondary level geography teachers' information service. The geography rooms are a kind of laboratory that should be stocked with audio-visual information materials that the teachers state they need for physical geography.
- Training of teachers for information literacy, particularly the use of email, the internet and other modern information e-resources is essential, given that some of the teachers had minimal training and guidance in using electronic information sources, while others never had any training, as shown in Chapter Four (section 4.2.4.4).

- High workloads for teachers mean that these teachers have limited time for lesson plan preparation and extensive information-seeking. Packaging of information related to the syllabus demands for geography is worth considering to render an effective information service.

Table 5.2 below reflects the key factors to be considered in the design of an information service for secondary level geography teachers in Lesotho, which will be done in the next chapter.

**Table 5.2: Key factors to consider for the geography teachers' information service**

<b>Factors</b>	<b>Suggested approach to information service</b>
Current information	Current awareness services
Variety of information formats	Collection of information in multimedia
Content for lessons	Variety of content related to geography, especially abstract physical geography themes
Social life information	Variety of information sources on HIV and AIDS, adolescents' social life, social assistance for orphans and vulnerable children, etc.
Pedagogy information	Variety of information sources for teaching methods and strategies, learners' assessment; classroom management
Reliability and accuracy of information	Seeking and disseminating information from reputable sources and agents
Information-seeking styles	Accommodating individual and collaborative information-seeking, information-seeking through proxies
Communication channels	Acknowledging and working through preferred channels of communication
Infrastructure	Acknowledging and working from existing infrastructure e.g. faxes, photocopying, printing; lobbying for improved internet access; lobbying for improved information infrastructure
Resource-sharing	Clustering of schools, inter-library lending systems, collaboration among researchers, stakeholder institutions, communities and teachers, development of resource centres
Media	Supporting access to various forms of media
Information dissemination	Tailor-made information packages for lesson plans and addressing the syllabus requirements
Training	Training of school librarians as people who can assist teachers with an information service; providing teachers with information literacy training, particularly the use of e-resources and the internet

## 5.10 CONCLUSION

This chapter interpreted the data that were presented in Chapter Four. Data interpretation was done according to major categories of analysis identified in section 5.1. These categories relate to the information needs and the information-seeking patterns of the secondary level geography teachers in Lesotho, as reflected in Chapter Four, and are based on the principal research question and research sub-questions outlined in section 1.2. The chapter also interpreted the data based on the Leckie *et al* (1996) information-seeking of professionals' model which was chosen as the theoretical framework guiding this study, as well as other literature and the researcher's experiences as a former geography teacher. The next chapter proposes an information service model for secondary level geography teachers in Lesotho based on the data that were presented and interpreted in Chapters Four and Five respectively. As a result, in Chapter Six there will be repetition of some points from Chapter Five because it is necessary to refer to previous points in order to make meaningful proposals.