CHAPTER THREE

THE NATURE AND STRUCTURE OF GEOGRAPHY AND ITS IMPLICATIONS ON THE APPLICATION OF OUTCOMES-BASED GEOGRAPHY TEACHING

3.1 INTRODUCTION

A discussion on the application of science process skills to the teaching of geography necessitates a reference to the nature and structure of geography. This chapter attempts to explore the nature and structure of geography and relates these to the South African outcomes-based education (OBE) framework. The chapter continues to justify the incorporation of science process skills into the teaching of geography.

Furthermore, the chapter highlights the implications of the nature and structure of geography on the teaching of outcomes-based geography. An attempt is made to also explore the implications for the critical and developmental outcomes and the Natural Sciences learning area's outcomes on the teaching of geography. The following section highlights the nature of geography.

3.2 THE NATURE OF GEOGRAPHY

Dreckmeyr, Maarschalk and McFarlane (1994: 11) believe that the nature of a discipline influences the way in which that discipline's knowledge is structured and processed. Hence, the nature of the subject also influences the way the subject is taught and learnt, which necessitates the following two questions:

- ☐ *What is geography?*
- ☐ *What does a geographer do?*

Marran (1994: 7) asserts that geography is a body of knowledge which has its own field of study and field of investigation. Like other natural sciences, geography has to do with direct experience of natural phenomena, human phenomena and with the collection of information and acquisition of knowledge. Geography can be described as a scientific body of knowledge which also organises and interprets geographical information collected through logical means. This method of investigation is known as the process of science (Van Aswegen, Fraser, Nortje, Slabbert and Kaske 1993: 2). Geography also attempts to explain and understand nature in all its phases, i.e. geography is a way of trying to understand nature. It should be noted that geography does not investigate fauna and flora extensively, as does biology. Shortle (1975: 286-293) observes that geography has three different dimensions, namely, the body of knowledge (substantive structure), the process by which the knowledge is obtained (syntactical structure) and the way of thinking that lead to a better understanding of nature.

It is clear from the foregoing text that without the process skills of science (syntactical structure) there could be little discovery of new geographical knowledge because science process skills are utilised to collect, organise and interpret information.

However, it is important to note that geography as a discipline of knowledge is ever-changing because its contents and methods have changed over years (Graves and Moore 1972: 18; James 1969: 475-476; Kohn 1982: 44-45 and Naish 1992: 53). The following paragraphs describe how geography moved from factual knowledge about the earth's surface, i.e. 'cape and bays'- 'state and capitals' approach and to a science of spatial correlations (cf. Figure 2.1), i.e. the study of relationships between different distributions on the earth's surface (Graves and

Moore 1972: 18) and more recently to contemporary geography that seeks to reveal the underlying connections that exist between knowledge, power and human interest (Unwin 1992: 1).

Kohn (1982:44) notes that geography in the 1920s studied man-land relationships or human ecology. At that time, it was believed that geography bridged the natural sciences and the social sciences. The geography of the 1920s was extremely explanatory and descriptive, and environmental determinism in its various forms dominated much geographical thinking. It was argued that the environment had dominance over people (Magi 1990: 4). Environmental determinism asserted that human actions were influenced by the environment. Environmental determinists espoused the view that the people's activities on earth were largely determined by the nature of the physical environment (Unwin 1992:92). In the 1940s and 1950s, the philosophy of probabilism which advocated the influence of people over the environment dominated geographical thinking (Magi 1990: 4-5).

In the 1950s and 1960s, the study of man-land relations was replaced by the study of the areal differentiation of the earth's surface. The study of geography became regional in its approach. Geographical content of this period described the variable character of the earth's surface (Kohn 1982: 44-45 and Unwin 1992: 98-116). At that time, the regional approach competed with the systematic approach for dominance. The systematic approach entailed the study of a single geographical phenomenon like rainfall or a group of related geographical phenomena like temperature, atmospheric pressure, cyclones, winds, and so on which determine the climate of a region. This method of study influenced geography to be divided into a number of systematic fields, which meant reorientation to economic, urban and human geography, including social, political and ecological geography. Geographers were also keen to formulate laws and theories of the spatial structure and human phenomena during this period (Kohn

1982:44-45) .

By the late1960s and early1970s geographers started to place much emphasis on topical geography and the introduction of the scientific method. This was the onset of the demise of regional geography. Geography adopted a positivistic school of thought, and it was argued that geographical knowledge could only be collected through using scientific procedures (Magi 1990: 5). Its central claim was that science was the only legitimate form of knowledge and that noticeable facts are the only possible phenomena of knowledge. Geography emerged as an empirical-analytical science (Unwin 1992: 106-135), claiming that experience instead of reason is the fountain of all knowledge. Empiricism emphasised the importance of observations to theoretical statements.

In the 1970s the scientific method began to loose favour as it was believed that it was impersonal, mechanical and displayed a lack of concern for individuals, and the contemporary social issues (Magi 1990: 5). This period was marked by the development of behavioural geography or historical-hermeneutic geography (Unwin 1992: 136 -157) which regarded an individual as a decision maker. There were two groups of behavioural geographers, namely, those who continued to use the spatial-scientific methodologies and humanists who studied unique events such as equality and justice (Kohn 1982:45).

This period in the development of geography emphasized geographical phenomenology. Magi (1990: 5) maintains that "*this school of thought argues that geographical knowledge can also be acquired through experience, intuition, introspection and behavioural procedures. It emphasizes man-land relationships by focussing on human experience and human actions, memories and perceptions.*"

For example, information and knowledge about causes of soil erosion in a village, may be given fairly accurately by people who have themselves never gone to school, but who have vast experience of the local causes of erosion, in opposition to people acquiring the information on the causes of erosion through scientific and conventional procedures.

When the changing nature of geography is considered, it is natural that the teaching and learning of geography should adapt to the changing nature of the discipline. The International Charter on Geographical Education (1992: 5) aptly describes the nature of **contemporary geography** as follows:

> *"Geography is the science which seeks to explain the character of places and the distribution of people, features and events as they occur and develop over the surface of the earth. Geography is concerned with human-environment interactions in the context of specific places and locations. Its special characteristics are its breadth of study, its span of methodology, its synthesis of work from the disciplines including the physical sciences and the humanities and its interest in the future management of people-environment interrelationships."*

The nature of contemporary geography implies that the subject has adopted the **process approach** which should be supplemented with active inquiry as the main style of teaching and learning, hence the next section discusses the structure of geography.

3.3 THE STRUCTURE OF GEOGRAPHY

Degenaar (1985) cited by Mhlongo (1996: 121) explains the structure of a discipline in terms of its concepts and classified system of knowledge. Geography as a field of knowledge also has a substantive structure of facts, concepts and generalisations, and a syntactical structure of skills or techniques (Shortle 1975: 290-293).

3.3.1 The Substantive Structure of Geography

Van Aswegen et al. (1993: 4) point out that "*the substantive structure is the content structure (the body of knowledge) and contains the facts, concepts and generalisation of the subject.*" Some of the conceptual building blocks peculiar to geography are:

- *location;*
- *spatial association;*
- *spatial distribution; and*
- *spatial systems* (Chapman 1966: 137).

These conceptual building blocks are similar to the central concepts of geographical studies listed by the International Charter on Geographical Education (1992:5) which are:

- *location and distribution;*
- *place;*
- *people-environment relationships;*
- *spatial interaction; and*
- *region* (International Charter on Geographical Education 1992: 5).

Chapman (1966: 137) further asserts that concepts and characteristics associated with location are site, situation, place and locality. Spatial distribution is allied with continuity, discreteness, contingency, pattern, and density. Spatial association allied concepts are integration, interdependence, coherence, ensemble, coincidence, and complementary. Spatial interaction is associated with accessibility, linkage, and flows whilst spatial systems are associated with connectivity, order and hierarchy.

Geography, therefore is a field of study with its own ideas, laws, theories and models which geographers use to seek an understanding of the spatial structuring of the universe. In sections 2.5.1, 4.4, 4.5 and 4.6 of this study, it is aptly shown how science process skills could be applied to the teaching of secondary school geography.

The discussion in these sections indicates that it is possible for one or more science process skills to be developed in each and every geography lesson regardless of the content. The development of skills is part of the syntactical structure of geography which may contribute to the discovery of new geographical knowledge.

3.3.2 The Syntactical Structure of Geography

Mhlongo (1996: 122) maintains that syntactical structure of a discipline indicates processes or epistemology of that discipline. The syntactical structure also plays a role in the formation of new concepts and generation of new knowledge. Gardner (1975) cited by Van Aswegen et al. (1993: 6) describes the syntactical structure in terms of competencies such as the sensorimotor skill, the cognitive domain and the use of techniques that should be mastered. Table 3.1 attempts to illustrate how each of these competencies could encourage the development of some science process skills in learners.

Table 3.1 Association of Competencies and Science Process Skills (continues)

COMPETENCY	EXAMPLE
1. The sensorimotor skill It involves the primary acceptance of issues (sensory) from the environment. This entails all five senses and the execution of the most basic spontaneous motor movement (Mhlongo 1996: 123 and Van Aswegen et al. 1993: 6).	The learner may *observe* the process of the fluvial cycle of erosion and then draw the youth, mature and old stages of this cycle. By *observing* and drawing the cycle the learner develops his/her sensorimotor skill (cf. 4.4.1). *Observing* the fluvial cycle of erosion and *communicating* by means of diagrams (sketches) are basic science process skills which are developed in this activity.
2. The cognitive domain It contains a variety of cognitive skills. These skills develop when a sensorimotor skill is guided by thinking (Mhlongo 1996: 123 and Van Aswegen et al. 1993: 6).	An activity which involves the *classification* of models of slopes into gentle, steep, concave, and convex slopes could involve cognitive skills such as *observing*, *inferring*, and *predicting*. This process may entail *observing* and touching the slopes, *inferring* what forces of nature could have shaped the slopes and *predicting* a kind of slope resulting from a particular force. This implies that *observing*, *inferring* and *predicting* are related cognitive skills which enable learners to *classify* the slopes (cf. 4.4.4). This activity clearly indicates the development of the basic science process skills such as *observing, inferring and predicting* in learners.

Table 3.1 Association of Competencies and Science Process Skills

COMPETENCY	EXAMPLE
3. The use of techniques A technique is executed when a scientific device is used as an extension of the human body.	The use of a climatological instrument such as an anemometer to *observe* the speed of wind may include the **sensorimotor skill** of *measuring*, the **cognitive skills** of *observing* and estimating the speed of the wind and *predicting* and *communicating* the kind of weather that may prevail within the next 24 hours. It also involves the **technique skill** of manipulating, operating and reading the anemometer to *measure* the wind speed. This activity contributes to the development of basic science process skills such as *observing, measuring, predicting and communicating.*

Table 3.1 indicates that geography has indigenous skills and techniques which are associated with science process skills. Geographers employ these skills and techniques when concerned with the *where*?, the *what there*? and the *why (how) there*? types of questions about spatial patterns (cf. 2.7). Seeking answers to these questions requires exploring the location, situation, interaction, spatial distribution and differentiation of phenomena on earth. An investigation of these geographical questions needs learners to explore and develop knowledge and understanding of geographical skills and science process skills as suggested (cf. 4.2).

Studies (Marran 1994: 8; Proctor 1987: 224 and Rawling 1992:295) indicate a rapidly growing debate on whether either concepts or skills should be the focus of geography. There seems

to be no general consensus as to the focus of geography. However, in recent years there have been increasing calls by some geography education researchers (Graves 1992: 27; Roberts 1992: 43-46 and Hawley 1992: 83-86) for greater attention to be paid to skills and outcomes so that the subject continues to retain its status in the curriculum and contribute to the development of modern economy which needs people who are highly skilled.

Some authors (De Souza and Munroe 1994:46; Salter and Riggs-Salter 1993: 154) in the United States of America have called for the implementation of standards-based geography that requires learners to demonstrate their knowledge. The researcher believes that the focus on standards is significant as it is concerned with what learners actually retain from their formal schooling. Standards are set of qualities or measures by which performance, skills, or other types of knowledge are judged (Spady 1994b: 192). This implies that learners would have to show the ability to understand and apply what they have learned. It also implies that the implementation of geography standards would require learners to master competencies such as the sensorimotor skills, cognitive skills and geographical techniques. Mastery of these skills is therefore being stressed and could be described as an outcome for the teaching of **contemporary geography**. This new development in the geography curriculum has rooted in Britain as well, where geography teachers cater for variations in the rate of learning among learners through outcomes-based teaching (Battersby 1997: 72-75).

In the South African education system, there is also a move towards the outcomes-based approach (cf. 3.4). The following paragraphs explain the factors behind this paradigm shift in some western countries in general and in South Africa in particular. It also explores some implications of outcomes-based education for the teaching of geography.

3.4 REASONS FOR A PARADIGM SHIFT TO OUTCOMES-BASED EDUCATION

Countries such as Australia, New Zealand and the United States of America (USA) started to experience a shift to outcomes-based education (OBE) in the 1980's (Killen 1999: 4). The move towards outcomes-based education in Australia was a by-product of the competency-based training (CBT) approach which had its roots in a desire to take a more national perspective on education by politicians, business leaders and educators (Killen 1998: 2). It seems as if the shift to outcomes-based education in Australia was a result of community's pressure for accountability in education. For instance, Killen (1999: 4) maintains that the shift rests on the simple notion that if education is achieving predetermined outcomes, all is well with education and, some would suggest, all will be well with the economy and with the future of the society. The shift to OBE was also experienced in the United States of America (USA). Spady (1994b: 29) has pointed out that three broad interrelated pressures affected the direction and intensity of school reform initiatives in the USA, namely,

- ☐ *the nature of Information Age economy and workplace*;
- ☐ *the changing demographic of society; and*
- ☐ *the rate and intensity of change affecting all social and political institutions.*

Subsequently, Spady (1994b: 28) argues that this complex, technologically dominated, multicultural, constantly changing world demands far higher learning results from schools than they have ever produced. It is believed that OBE has the inherent potential to meet these demands.

Analyses of various reports of the Department of Education indicate that South Africa has also joined the 'bandwagon' on OBE, as advocated in Australia and the USA (Department of

Education 1997a, Department of Education1997b, Department of Education 1997c, Department of Education 2001a and Department of Education 2001b).

A thorough analysis of the old and new South African education systems is beyond the scope of this study. The following discussion is confined to some historical, political and educational factors that contributed to the paradigm shift in the South African education system. The change from the old education system to the new education system based on outcomes, was necessitated by several factors which are discussed in the next paragraphs.

At the outset, it is necessary to point out that after the National Party came into power in 1948, it introduced an education system which was shaped largely by apartheid and underdevelopment (Hofmeyr and Buckland 1992: 20; and Department of Education 1997b: 8). The education system was largely fragmented and compartilised. There were separate subsystems of education for the 'White', 'Indian', 'Coloured' and 'Black' population groups. This resulted to different nineteen education departments in South Africa (Department of Education 2001a: 10). Eleven of these departments administered 'black' education. These subsystems of education led to disparities and inequalities in education for different racial groups. It also led to disparities in the educational standards of different education departments. This crisis was as a result of Christian National Education (CNE) philosophy of the National party's government. In 1948, the Institute for Christian National Education released a document of which Article 15 laid policy on 'black' education. Article 15 states:

> *We believe that the calling and task of white South Africa with regard to the native is to Christianise him and help him on culturally, and that this calling and task has already found its near focussing in the principles of trusteeship, no equality and segregation... We believe that the teaching and education of the native must be grounded in the teaching in life- and world-view of the white trustee... (and that the native must accept) the Christian and national principles in our teaching...* (Hartshorne 1989: 110-111).

Careful analysis of this statement indicates that the education system sought to develop Afrikaner language, beliefs, culture, history and religion. Education was used to foster loyalty to the Afrikaner nation. This implies that Christian National Education legalised separate development and the 'own affairs departments' in education. This policy encouraged the development of attitudes, beliefs and values that did not promote interaction among different cultural groups.

Thus, it can be argued that the "old" education system had to change because it was an inequitable system. The best way to remove inequality is to insist that all educational activities should focus on helping learners to learn things that will be useful to them. Outcomes-based education is regarded as an instrument for learners to learn what they would be able to demonstrate.

Van der Horst and McDonald (1997: 5) maintained that educational change was necessary because learners were not encouraged to value aspirations and perspectives of other cultural groups, and that most learners' educational training opportunities were inadequate. After the African National Congress (ANC) came into power in 1994, a new national ministry of education and nine provincial education departments were established. The national ministry of education sought to overhaul the education system of the country. In 1995 a South African Qualifications Authority (SAQA) was instituted by the Department of Education to embark on curriculum review. One of its tasks was to establish the guidelines for education in South Africa. SAQA recommended the adoption of an education system that would promote lifelong learning. It was believed that the new education system would "*...meet the economic and social needs of South Africa and its people*" (Department of Education 1997a: 2) and enable the citizens to compete globally. In order to meet these challenges, SAQA suggested the development and implementation of the new curriculum, namely Curriculum 2005. The new

curriculum advocated for a transformed educational approach which focussed on what was learnt and whether learning was successful rather than on when and how learning took place.

This educational approach is known as outcomes-based education (OBE). In this approach, the learners demonstrate what they can do with what they know and understand (Spady 1994b: 49), which is a change in the education system from a content-based approach to an outcomes-based approach (Department of Education 1997a: 5). In South Africa, OBE has taken an approach (cf. 3.5) that emphasises outcomes that relate to learners' future life roles (Killen 1999: 2). The new education system is required to break down class, race and gender stereotypes (Department of Education 1997a: 2). It is believed that Curriculum 2005 would promote critical thinking, rational thought and deeper understanding through outcomes-based education.

3.5 CURRICULUM 2005

In order to eliminate the legacies of the past education system which was fragmented and inadequate, the Department of Education decided to embark on Curriculum 2005 that was strengthened by a revised National Curriculum statement for schools (Department of Education 2001a: 4). This is a national curriculum framework which is based on outcomes-based qualification's framework.

The South African Qualification Authority (SAQA) was established to set the standards and the quality of educational outcomes. The South African Quality assurance Act of 1995 legitimised SAQA. The National Qualifications Framework (NQF) provides lifelong learning opportunities utilising nationally recognised levels of the South African Qualifications Authority.

Malan (1997: 3) has pointed out that the development and maintenance of a national, outcomes-based qualifications framework in South Africa would

- *create opportunities for all South African to become lifelong learners;*
- *remove artificial boundaries between education and training by integrating theoretical and practical learning and teaching;*
- *make education and training relevant to the needs of individual learners and of the country as a whole;*
- *establish credible standards and qualifications which would be recognised and accepted nationally and internationally;*
- *make education and training accessible to all those who wished to learn; and*
- *establish a flexible education and training system which would offer different routes (or learning pathways) by means of which learners could accumulate credits and gain qualifications.*

Table 3.2 indicates the structure of the National Qualifications Framework (NQF). It is just a description of how education qualifications are organised, classified and accredited in South Africa. The NQF which registers national standards and qualifications has eight levels and three main bands, namely, the General Education and Training band (GET), the Further Education and Training band (FET) and the Higher Education and Training band (HET).

Table 3.2 National Qualifications Framework

School Grades	NQF Level	Band	Types of Qualifications & Certificates
	8	Higher Education	Doctorates Further Research Degrees
	7	and	Higher Degrees Professional Qualifications
	6	Training Band	First Degrees Higher Diplomas
	5	(HET)	Diplomas Occupational Certificates
Further Education and Training Certificates (FETC)			
12	4	Further Education	School/College/NGOs Training certificates, Mix of Units
11	3	and	School/College/NGOs Training certificates Mix of Units
10	2	Training Band (FET)	School/College/NGOs Training certificates Mix of Units
General Education and Training Certificates (GETC)			
9	1	General Education and Training Band (GET)	Senior Phase	ABET LEVEL 4
8				
7			Intermediate Phase	ABET LEVEL 3
6				
5				
4			Foundation Phase	ABET LEVEL 2
3				
2				
1				ABET LEVEL 1
R			Reception Phase (Pre-school)	

(Department of Education 1997b: 16)

3.5.1 The General and Training Band

The General and Training Band which accommodates pre-school to Grade 9 represents nine years of compulsory education. It consists of the reception phase (pre-school), the foundation phase (Grades 1-3), the intermediate phase (Grades 4-6) and the senior phase (Grade 7-9). A learner who attends formal schooling receives the general education and training certificate at the end of Grade 9.

An adult or a youth not attending school receives the same certificate after working through adult basic education and training programmes (ABET levels 1-4). Level 4 of ABET is equivalent to Grade 9. The learning outcomes for Grade 9 are identical to the learning outcomes for ABET level 4. At the end of this band, the learner is expected to be:

- *confident and independent*;
- *literate, numerate and multi-skilled*; and
- *compassionate, with respect for environment and ability to participate in society as a critical and active citizen* (Department of Education 2001c: 5).

After this phase, the learner may move to the Further Education and Training Band.

3.5.2 Further Education and Training Band

The Further Education and Training band accommodates Grade 10 to Grade 12. Grade 12 represents the end of formal schooling and learners who achieve the learning outcomes for this band are awarded the further education and training certificate. Some learners may reach this level through non-formal and informal education. These learners are also awarded the further education and training certificate. It is likely that geography would also be incorporated in this

band. The next phase of the NQF is the Higher Education and Training band.

3.5.3 Higher Education and Training Band

This band accommodates qualifications offered by universities, colleges of education and technikons. Learners who achieve outcomes set out in programmes offered by these institutions are awarded degrees, diplomas or certificates. Geography is offered at universities and colleges of education, but technikons do not. In most South African universities, the Department of Geography are housed in the Faculties of Natural Sciences.

All programmes offered in these bands are based on outcomes (cf. 3.8) which are formulated in terms of standards, hence the next section discusses the nature of outcomes-based education.

3.6 THE NATURE OF OUTCOMES-BASED EDUCATION

Killen (1999: 4) pointed out that in Australia the stimulus for outcomes-based education was political. The Federal government wanted economic efficiency and accountability, which is a means of evaluating the quality and impact of teaching in a specific school (Jansen 1997: 1). There were also calls for schools to produce measurable 'outputs' commensurate with the public moneys invested in them. Spady (1994b: 28) and Manno (1995: 1) also noted that some States in the USA implemented OBE which demanded higher learning results from schools to give parents, politicians, educators, future employers and the general public an accurate picture of learners' capabilities. Furthermore, outcomes-based education enabled these groups of people to determine whether their investment in public education was resulting in improved learning and achievement at higher levels. This implies that Australia and the USA

implemented OBE to enable taxpayers to hold educators accountable for higher learning results.

In outcomes-based education programmes, the focus is on the learning results and performance expectations (Van der Horst and McDonald 1997: 7 and Spady 1994b: 2). Learners are supposed to acquire and master knowledge, skills and values. What is of importance is what the learners know, can do and the attitudes and values they display. Learners should be able to demonstrate their understanding of knowledge and transfer and apply the desired outcomes to new areas and context. In OBE, the most important activity it seems is the use of content to perform or demonstrate a task.

OBE has its foundation on competency-based learning and mastery learning. Competency education has all elements of OBE. It is built around the integration of outcome goals (in terms of skills), instructional experiences (to teach the outcomes) and assessment tasks (to determine whether learners have mastered the outcomes) (King and Evans 1991: 74; Van der Horst and McDonald 1997: 10, and Fraser 1999: 4). Van der Horst and McDonald (1997: 10) argue that competency education

> *... supports the idea that all learning is individual and the individual (whether the teacher or the learner) is goal-oriented. Furthermore, the teaching-learning process is facilitated if the teacher knows what he/she wants the pupil to learn and if the learner knows exactly what he/she is required to learn. Additionally, personal responsibility or accountability for learning is emphasised.*

This is similar to the premises on which OBE is based which are listed on page 117. As it has already been mentioned, another root for OBE is mastery learning. The general aim of mastery learning is to ensure that learners are granted opportunities to be successful at most activities, by supplying suitable learning conditions, materials and back-up guidance (Van der

Horst and McDonald 1997: 11). Furthermore, Bloom (1984: 4) maintains that in mastery learning:

> *Students learn the subject matter in a class with about 30 students per teacher. The instruction is the same as in the conventional class and is usually with the same teacher. Formative tests (the same tests used with the conventional group) are given for purposes of feedback followed by corrective procedures and by parallel formative tests to determine the extent to which the students have mastered the subject matter.*

This implies that in mastery learning, the teacher strives to enquire why learners fail to master the content. Subsequently, the teacher provides the learners with more learning time, different learning media or materials, or diagnose the prerequisite knowledge or skill the learners should gain to master the content (Van der Horst and McDonald 1997: 11). Mastery learning process is a method of improving the learners' learning from the same teaching over a series of learning tasks (Bloom 1984: 7). This implies that mastery learning also has aspects which relate to OBE.

Spady (1988: 5) maintains that outcomes-based education means organizing for result as teachers based what they do instructionally on the outcomes they want to achieve. Teachers determine the knowledge, competencies and qualities they want learners to demonstrate when they finished school and face the opportunities of an adult world. Spady (1994b: 9) also points out that OBE is based on the following three premises:

- *all students can learn and succeed, but not on the same day in the same way;*
- *successful learning promotes even more successful learning; and*
- *schools control the conditions that directly affect successful school learning.*

These premises imply that OBE is learner-centred and is based on the belief that all people can

learn, as Baron and Boschee (1994: 193) and Killen (1999: 5) assert that in broad terms, outcome-based education is:

- *a commitment to the success of every learner;*
- *a philosophy that focuses educational choices on the needs of each learner; and*
- *a process for continuous improvement*

Furthermore, Baron and Boschee (1994: 193) and Spady (1994b: 10) explain that the strategy for outcomes-based education implies that:

- *what a student is to learn is clearly identified;*
- *each student's progress is based on demonstrated achievement;*
- *each student's needs are accommodated through multiple instructional strategies and assessment tools; and*
- *each student is provided time and assistance to realize his or her potential.*

In OBE, the outcomes are the starting point of educational planning and all teacher activities are focussed on helping learners to achieve these outcomes. Teachers' choice of content, teaching methods, assessment and resources, all come after they have decided what is that learners should be able to do as a result of teachers efforts to help learners learn.

When planning a lesson the teacher should start by formulating *outcomes*, for his or her lesson. Outcomes are statements of intention, written in terms of learner learning. Killen (1999: 4) defines outcomes as "*statements of intent, or statements of desired educational outcomes, focus attention on the purpose of instruction, rather than on the content or learning experiences that are the vehicles for instruction... OBE gets us to think about why we are teaching what we*

are teaching, and why we are teaching it in a particular way." This implies that outcomes are statements of the significant things that learners should be able to demonstrate as a result of a period of instruction and learning.

However, it is important to note that not all people (Schlafly 1993: 1-8 and Jansen 1997: 1-9) are in favour of OBE. Some researchers disagree with the outcomes that have been prescribed whilst others disagree with the whole outcomes-based education approach.

3.7 SHORTCOMINGS OF OUTCOMES-BASED EDUCATION

Researchers such as (Baron and Boschee 1994: 195; Brandt 1994: 1; Burron 1994: 74; Manno 1995: 721; O' Neil 1994: 8 and Zitterkopf 1994: 78) point out that some OBE critics claim that most prescribed outcomes are too vague, attitudinal and relate to values that are not sufficiently academic. It is argued that outcomes-based education only emphasises affective outcomes at the expense of cognitive outcomes or academic skills such as reading, writing and arithmetic (Schlafly 1993: 1). It is claimed that OBE is likely to lead to the lowering of standards and academic decline. This criticism is a naive because it is based on the assumption that nothing academic is never done in OBE. It is possible for teachers to set challenging tasks in their programme. Consider an outcome like *learners will use process skills to investigate phenomena related to geography*. This outcome entails learners collecting, analysing, organising and evaluating information, and understanding the world as a set of related systems. These activities are all academic in nature as the use of science process skills is academic. Zitterkopf (1994: 76) is of the opinion that the schools whose focus is on the achievement of results are likely to attain the results and a higher level of the quality in the process and the product.

Furthermore, opponents of OBE claim that outcomes which describe learners as 'effective communicators' or 'problem solvers' are ill-defined, nebulous and result in less academic rigour (O' Neil 1994:8). Zitterkopf (1994: 78) advises that affective outcomes should be integrated with academic outcomes to achieve the highest level of student learning in both areas, which implies that affective outcomes should be rooted in the academic framework.

According to Boschee and Baron (1994: 195) and Zitterkopf (1994: 76) some Christian critics of OBE claim its outcomes in social/affective areas are value-laden, challenge traditional family values and take the role of parents in moral education. It is also claimed that some textbooks are morally offensive as they condone homosexuality.

Besides academic and moral complaints about OBE, other complaints are political. For example, it is claimed that a critical outcome such as *learners should work effectively with others as members of a team, group, organisation and community* conditions learners to be cooperative and pliable workers and citizens of the New World Order (Bonville 1996: 2).

Opponents of OBE further contend that group problem solving and cooperative learning which are instructional vehicles of OBE are flawed as they undermine children values, individuality, and commitment to personal responsibility (Burron 1994: 74). It is further argued that high achievers suffer as they must wait until their peers exhibit mastery of desired outcomes (ASCD Update 1994: 1 and Bonville 1996: 3). This implies that opponents of OBE favour a competitive model under which learners compete with each other. ASCD Update (1994: 2) also notes that opponents of OBE claim that learners' motivation suffers as they know that they have multiple opportunities to pass a test, hence there is no pressure to study.

In his paper entitled *Why OBE will fail* , Jansen (1997: 1-9) has identified ten reasons why OBE

will fail in South Africa, which are:

- the language associated with OBE is too complex and inaccessible. Therefore, most teachers may not be able to give OBE's policy papers meaning through their classroom practices;

- OBE as curriculum policy is lodged in problematic claims and assumptions about the relationship between curriculum and society. Proponents of OBE in South Africa claim that its implementation could lead to a high economic growth. Jansen (1997: 3) notes there is no evidence which suggests that a change in school curriculum leads to an improvement in national economies;

- OBE will fail because it is based on flawed assumptions on what happens in schools, classroom organisation and the kinds of teachers who are within the system. The type of OBE implemented in South Africa requires highly skilled and qualified teachers who are in the minority in South Africa, hence teachers call for more time and training before it is implemented;

- OBE is undemocratic because outcomes are specified in advance. There is a fundamental contradiction when insisting that students use knowledge creatively only to inform them that the desired learning outcomes are already specified;

- there are important political and epistemological objections to OBE as curriculum policy. The motive of the African National Congress (ANC) and alliance partners who predicated their politics on the notion of 'process' and organise their policies on a platform of 'outcomes' are questioned. Educational and political struggle of the 1980's valued the processes of learning and

teaching as ends in themselves. Few teachers participated in OBE's committees. As a result, the majority of teachers have little information and understanding of OBE;

- OBE with its focus on instrumentalism - what a student can demonstrate given a particular set of outcomes - sidesteps the important issues of values in the curriculum. Jansen (1997: 6) notes that core values such as combatting racism and sexism, which are relevant to the South African transition are not evident in the reports of learning area committees;

- the management of OBE will multiply the administrative burdens placed on teachers. For instance, teachers would be required to reorganise curriculum, increase the amount of time allocated for monitoring individual student progress against the outcomes, administer appropriate forms of assessment and maintain comprehensive records (Jansen 1997: 7). These conditions will not be conducive for OBE's success;

- OBE trivialises curriculum content even as it claims to be a potential leverage away from content coverage which besets the current education system. This implies OBE neglects curriculum content at the expense of outcomes;

- it requires trained and retrained teachers and principals who would be able to implement it, new forms of assessment such as performance assessment or competency based assessment, new forms of learning resources and teachers' cooperation when they learn the process of implementation; and

- it requires a radical revision of the system of assessment. For instance, the policy of continuous assessment which is difficult to apply to the matriculation examination, hence OBE would be implemented in a traditional assessment education system. As a result of this, OBE's principles may not be realised.

The Department of Education in South Africa should seriously take note of these criticisms and attempt to retrain practising teachers on OBE principles and strategies and also introduce OBE programs that could stimulate teachers' interest in OBE. As a result, teachers could appreciate and embrace the new curriculum and implement it in their classrooms with enthusiasm (cf. 7.3).

Notwithstanding the shortcomings of outcomes-based education mentioned above, McGhan (1994: 70) points out that OBE:

- *reduces rote learning;*
- *increases learners' ability to appreciate and deal with real life situations;*
- *eliminates permanent failure as learners who have not achieved the standard are given the opportunity to do so; and*
- *eliminates compromised learners as they are expected to master and demonstrate the identified outcome before moving on.*

The South African Qualifications Authority emphasises that learning should focus on critical outcomes that "*will ensure that learners gain the skills, knowledge and values that will allow them to contribute to their own success as well as to the success of their family, community and the nation as a whole*" (Department of Education 1997b: 10). The envisaged skills, knowledge and values are based on the critical and developmental outcomes espoused by the Department of Education.

3.8 CRITICAL AND DEVELOPMENTAL OUTCOMES

The critical and developmental outcomes were identified specifically for the South African scenario. Spady (1994b: 70-71) maintains that the critical and developmental outcomes are life roles which are a set of responsibilities that define an individual's position within a society's economic, political, and social relationships. In the South African OBE system, critical and developmental outcomes are broad, generic, cross-curricula and cross-cultural. They are general outcomes which are applicable to all learning areas (cf. 2.2.4).

These outcomes are the ultimate desired result of education in South Africa and they are related to learners' future life roles. The critical outcomes are more or less identical to Spady's (1994a: 21-22 and 1994b: 70-71) life performance roles (cf. 1.4). The actualisation of critical and developmental outcomes in learners is deemed to be the responsibility of teachers. One way of preparing learners for these life roles is to "*continually engage students in both individual and team activities that explore important issues or phenomena, use multiple media and technologies, create products that embody the results of students' explorations, and call for students to explain their work and products to adults and students audiences*" (Spady 1994a: 22). Therefore, teaching and learning activities in all learning areas in South Africa are to develop and promote the following critical outcomes to enable learners to:

- ☐ *Communicate effectively using, mathematical and language skills*;
- ☐ *Identify and solve problems by using creative critical thinking*;
- ☐ *Organise and manage activities responsibly and effectively*;
- ☐ *Work effectively with others in a team, group, organisation and community*;
- ☐ *Collect, analyse, organise and critically evaluate information*;
- ☐ *Use science and technology effectively and critically, showing responsibility*

towards the environment and health of others; and

- *Understand that the world is a set of related systems.*

Furthermore, teaching and learning activities in all learning areas are to promote the following developmental outcomes to enable learners to:

- *Reflect on and explore a variety of strategies to learn more effectively*;
- *Participate as responsible citizens in life of local, national and global communities*;
- *Be culturally and aesthetically sensitive across a range of social contexts*;
- *Explore education and career opportunities; and*
- *Develop entrepreneurial capacities* (Department of Education: 1997a: 17; Department of Education 1997b: 24 and Department of Education 2001a: 17).

In Chapter 4, it is illustrated that some of the outcomes mentioned above are associated with science process skills and can be realized and achieved as observable and demonstrable outcomes. Therefore, science process skills are actually effective outcomes and should be taken into consideration in the teaching of geography.

These critical and developmental outcomes form the foundation for learning area outcomes. Learning areas outcomes are more specific outcomes which are applicable to a specific learning area only, and need to be emphasised by teachers in their daily work. As geography falls within the Natural Sciences (NS) learning area (cf. 3.7.3), learning outcomes for this learning area which are associated with science process skills are discussed in the section that follows.

3.9 NATURAL SCIENCES LEARNING AREA'S OUTCOMES THAT ARE ASSOCIATED WITH SCIENCE PROCESS SKILLS

In South Africa, knowledge has been integrated into eight learning areas (cf. 2.2.4). Each learning area has its own outcomes which include skills, abilities and values which every learner is supposed to know, understand and perform. The rationale for the eight learning areas is found in the document of the Department of Education (1997b: 22-238). It describes the rationale of the Natural Sciences as follows:

> *The Natural Sciences, comprising the physical, life and earth sciences, involve the systematic study of the material universe - including natural and human-made environments - as a set of related systems. A variety of methods, that have in common the collection, analysis and critical evaluation of data, are used to develop scientific knowledge. Learners need to know that Science is a human activity, dependent on assumptions which change over time and over different social settings.*
>
> *The development of appropriate skills, knowledge and attitudes and an understanding of the principles and processes of the Natural Sciences:*
>
> - *enable learners to make sense of the natural world;*
> - *contribute to the development of responsible, sensitive and scientifically literate citizens who can critically debate scientific issues and participate in an informed way in democratic decision-making process;*
> - *are essential for conserving, managing, developing and utilising natural resources to ensure the survival of local and global environments; and*
> - *contribute to the creation and shaping of work opportunities.*
>
> *In view of its potential to improve the quality of life, learning in the Natural Sciences must be accessible to all South Africans.*
>
> *The investigative character of knowledge acquisition in the Natural Sciences should be mirrored in education. Learners should be active participants in the learning process in order to build a meaningful understanding of concepts which they can apply in their lives.* (Department of Education1997b: 22-238).

This rationale forms the foundation of this study as analyses of the learning outcomes for the natural sciences support the application of science process skills to the teaching of secondary school geography.

Following are learning outcomes for the natural sciences (Department of Education 2001b: 18 - 22) that are associated with science process skills:

☐ *Use process skills to in a variety of settings*

This outcome involves the development of investigative process skills. Learners conduct investigations in which a variety of process skills are applied, namely, questioning; observing; hypothesising; predicting; the collection, recording, analysis, evaluation and interpretation of data; and the communication of findings and/or conclusions (cf. 4.4 & 4.5).

In any investigation, phenomena are identified and questions are posed, situations are analysed and investigative questions are formulated, observations are made, hypotheses are formulated, predictions are made, investigative plans of action are formulated, evidence is collected and recorded, evidence is analysed, evaluated and interpreted, and conclusions are communicated.

☐ *Apply scientific knowledge and understanding*

This outcome develops the capacity of learners to work on problems using scientific knowledge and skills. The learners are expected to be able to answer questions about the nature of the world and to make verifiable predictions

- *Gain an appreciation of the relationship and responsibilities between science and society*

This outcome addresses issues such as environmental degradation, better ways of communicating, improved way of transport and so forth.

The need to apply science process skills to the teaching of geography is explained in section 4.2. The following section attempts to explain the implications of critical and developmental outcomes and the Natural Sciences learning area's outcomes on geography education.

3.10 THE IMPLICATIONS OF THE CRITICAL AND DEVELOPMENTAL OUTCOMES AND THE NATURAL SCIENCES LEARNING AREA'S OUTCOMES ON THE TEACHING OF GEOGRAPHY

What do all these outcomes mean to a geography teacher? The kinds of skills, knowledge and values put forward in the critical and developmental outcomes and the Natural Sciences learning area outcomes have implications on teacher and learner practices. Wessels and Van der Berg (1998: 11) assert that both sets of outcomes demand proactive and critical learners who are able to take control of their learning, rather than passive recipients of knowledge or information. This suggests that learners should be able to apply skills and outcomes rather than reproduce facts or ideas. It also implies that the learner learns by combining and practising a variety of science process skills connected to a real-life problem or context. If most learners are not able to demonstrate the designated skills, the researcher surmises that it could be difficult for them to address social and environmental issues that may appear in the 21st century. The promotion of social development and social justice is likely to be difficult as people could find it hard to use a range of skills and techniques in problem solving.

People who have learned outcomes-based geography should be able to identify and define the social and environmental issues they want to address, which would require them to formulate hypotheses, to observe, to decide on what information to collect, to classify the collected information and so forth. After these processes have been done, the people would be required to apply skills and techniques required for data analysis such as tables (cf. 2.5.2.2) and graphs (cf. 2.5.2.3). These may enable them to look for order, patterns and relationships in their natural world. By doing these, it should be easy to draw conclusions and address the social and environmental problems with critical understanding. Natural Sciences learning area's outcomes were designed to equip learners with skills that may enable them to make sound judgements and take appropriate social and environmental actions that could benefit South African society.

Therefore, OBE suggests that before deciding to teach particular geographical skills such as science process skills, teachers should be absolutely clear about what they want learners to learn. Then, teachers should select activities that are the best way to assist learners to learn the process skills of science.

The same process is also applicable to the teaching of geographical content. OBE encourages teachers to first decide outcomes that learners should achieve and then select the content that would help learners to achieve the envisaged outcomes. This approach is much more likely to result in learners learning knowledge, skills and values that are relevant and useful to them in the 21st century.

Geography lessons' outcomes should always focus on significant learning. The learners should learn knowledge, skills and values that they would be able to use after they have finished their formal education. Therefore, effective outcomes-based geography teaching is

only possible if geography is presented as a subject that equips learners with knowledge, skills (competencies) and qualities that are needed to be successful after they have exited the education system.

It could also be stressed that geography teaching activities should be structured in such a way that outcomes can be achieved and maximised by all learners. Hence, the teaching of geography could equip learners with competencies and qualities needed to face the economic, social and political challenges of the country.

3.11 CONCLUSION

Geography as an independent subject is firmly entrenched in the South African schools' curriculum. The implications of Curriculum 2005 on geography education are based on the principles of Curriculum 2005. Some of these principles are innovative teaching, development of skills, teamwork, co-operative learning, problem-solving, creativity, and active learning. These principles imply that Curriculum 2005 is learner-centred. Furthermore, the principles imply that geography teachers should not encourage learners to memorise geographical knowledge without insight and understanding. Geography teachers should encourage learners to do things, to discover knowledge and to communicate what they have discovered.

Geography teachers are also expected to guide and facilitate learning and to nurture and support learners. This does not mean that teachers should discard everything they have been doing in the past. Traditional teaching strategies would still have a role to play provided that the teaching of geography focusses on assisting learners to actualise the critical and developmental outcomes and the outcomes for the Natural Sciences learning area.

The principles of Curriculum 2005 thus provide for active and participatory learning. Learners should become investigative and work co-operatively. This process could motivate learners and increase their self-esteem and chances of success. Thus the aim of Curriculum 2005 is to develop people who can communicate and solve problems with confidence, and possess good interpersonal skills and life skills.

Geography teachers and learners should improve and adapt their activities and practices to the outcomes-based approach. They way to implement this in geography is explained in chapter 4 that attempts to describe the application of science process skills to the teaching of geography.