

CHAPTER 4

Findings

4.1 Overview

The previous chapter gave a detailed explanation of how data was collected and would be analysed. The findings show that the study was prompted from a public perception that, results in Geography in Lesotho since 2000 have declined, that errors students make tend to recur in exams, and that ways were needed to prevent failure rate in Geography declining further. However, findings revealed that Geography performed consistently at 70%+ pass rates throughout the study period and also performed more or less similar to the South African matric Geography as a result the public perception became a false assumption. In spite of these pass rates, findings revealed also that students made many errors in the examination and broadly speaking, of two major categories: Geographical and Non-Geographical. This chapter identifies patterns of performance in all the COSC and core subjects and benchmarks them against those in the S.A. matric Geography. It also identifies the errors that students made in the examination and discusses in detail the strategies suggested by the key informants for the correction of errors in order to improve students' performance in Geography.

4.2 Patterns in Pass Rates 2001-5 in all COSC subjects

Following Hatch's (2002: 155) definition, "patterns" refer to "regularities – they come in several forms, including similarity (*things happen the same way*), difference (*they happen in predictably different ways*), frequency (*they happen often or seldom*) and sequence (*they happen in a certain order*)". In this study patterns refer to the regularities by difference and similarity of performance in terms of frequency of pass rates. In response to the first research question, "What patterns of student performance are found at COSC level particularly in Geography between 2001 and 2005?" findings revealed that the patterns were identified within the six levels of performance starting with 90%+ which was predominantly practical subjects: Fashion and Fabrics, Woodwork, Food and Nutrition, Home Management, Geometric/Mechanical Drawing achieving the highest pass rates of all the subjects taken for examination with slight variation from 2001-5. Secondly, the next five levels comprise a mix pass rates from academic subjects with one or two practical subjects and these levels showed the pass rates of: 80%+, 70%+, 60%+, 50%+ and below 50%. Variability in pass rates across the years 2001-5 showed that the pass rates dropped between the years 2002 – 4 in several groups, several subjects not being taken between the years 2002 – 4 and erratic or unusually low pass rates in one year as indicated in Table 6.

Table 6 COSC Pass Rates in all subjects 2001- 2005

<u>Level</u>	<u>Subject</u>	<u>2005</u>	<u>2004</u>	<u>2003</u>	<u>2002</u>	<u>2001</u>
Group 1 – 90% plus	1. Fashion & Fabrics	99	99	90	99	95
	2. Woodwork	95	97	95	97	98
	3. Food & Nutrition	95	96	97	95	98
	4. Home Management	95	99	99	95	77
	5. Sesotho	93	93	94	90	92
	6. Geometric/Mechanical Drawing	90	83	83	86	86
Group 2 – 80% plus	7. Physics	84	61	0	44	41
	8. Metal Work	83	99	93	88	80
	9. Combined Sciences	82	88	88	88	84
	10. Commercial Studies	82	68	82	82	92
Group 3 – 70% plus	11. English Language	76	75	80	76	72
	12. Religious Studies	76	79	80	77	77
	13. Geography	75	75	73	74	74
	14. Commerce	74	63	63	64	60
	15. Additional Combined Science	72	73	72	76	67
	16. Agriculture	72	72	70	77	66
	16. Science (Biology, Physics)	71	30	10	30	76
Group 4 – 60% plus	18. Science (Chemistry Physics)	68	68	70	70	65
	19. Science (Biology, Chemistry)	63	73	74	68	69
	20. French	61	0	0	44	63
	21. Development Studies	60	55	64	62	63
Group 5 – 50% plus	22. Principles of Accounts	55	56	52	54	53
	23. 002158 History	53	37	51	35	54
	24. 002160 History	52	48	48	48	43
	25. Computer Studies	52	25	09	20	16
	26. Literature in English	51	49	50	49	48
	27. Biology	50	43	40	38	38
	28. Additional Mathematics	50	0	0	0	20
Group 6 – Below pass mark 50%	29. Human & Social Biology	49	50	53	55	46
	30. Mathematics	36	36	31	34	32
	31. Chemistry	0	13	0	27	25
	32. Economics	0	0	28	33	39
	33. Law	0	0	0	0	29

0 – subject not offered in that particular year

Red bold percentiles indicated a mark below 50%

Source: Examinations Council of Lesotho, Syllabus Grade Analysis Reports: 2001 – 2005

The 2005 pass rates provided a guide in identifying patterns of performance since they were recent while the 2002-4 showed variation across the years. Two distinctive patterns were identified, one predominantly practical subjects, and two, predominately academic subjects. The first level showed pass rates ranging from 90%+ and the pattern comprises predominantly practical subjects achieving the highest pass rates with Sesotho, a language subject. These include: Fashion & Fabrics (99%), Woodwork (95%), Food & Nutrition (95%), Home Management (95%), Sesotho (93%) and Geometric/Mechanical Drawing (90%). Level 1 has the most stable pass rates with slight variation. This level consistently maintained the 90%+ pass rates in the first five subjects through out the study period except for Home Management which achieved a low of 77% in 2001. Geometrical/Mechanical Drawing also declined from 86% to 83% between 2001 and 2004.

Following these, were the next five levels which comprised mostly pass rates from academic subjects with a mix of one or two practical subjects. The second level comprises 80%+ pass rates and the pattern is a mix of Science, Practical and Commercial subjects. Physics (84%) has the highest pass rate which was an improvement from a low of 41% in 2001, 44% in 2002 and a slight increase to 61% in 2004. This was followed by Metal Work (83%), then Combined Sciences (82%) and Commercial Studies (82%). There is quite a variation in pass rates from 2001 to 2005 for instance, Metal Work increased steadily from 80% in 2001 to 99% in 2004 which is beyond the boundaries of the 80%+ strand. Combined Science (Biology, Physics & Chemistry) consistently sustained the 80%+ pass rates throughout the years with great stability from 2002 - 4 where studies achieved a constant pass rate of 88%. Lastly, Commercial Studies achieved the highest pass rate of 92% in 2001 which declined to 82% in 2002 and 2003. There was also a remarkable decline to 68% in 2004 and an increase to 82% in 2005.

In the third level, pass rates range from 70%+ and the pattern is unclear with a variety of different subject groupings - languages, religion, commercial and science subjects. English Language (76%) and Religious Studies (76%) achieved the highest pass rates in 2005, followed by Geography (75%), Commerce (74%), Additional Combined Science (72%), Agriculture (72%) and then Science (Biology & Physics) (71%). English Language and

Religious Studies maintained 70%+ pass rates increasing to the highest of 80% in 2003 followed by consistent 70%+ pass rates in Geography throughout with almost no variation. Although Commerce ranked fourth with 74% pass rate in 2005, this was ranging from a low of 60-63% between 2001 and 2003. Additional Combined Science and Agriculture maintained 70%+ pass rates for four consecutive years 2002-4 except for 2001 when Additional Combined Science achieved a decline from 67% and 66% for Agriculture. Science (Biology & Physics) maintained the 70%+ at the extremes: 2001 and 2005 however, the pass rates dropped drastically to 30% in 2002, a low 10% in 2003 and 30% in 2004. As a result Science (Biology & Physics) had the highest range from 10 - 76% implying that only a few students made it in 2003.

In the fourth level pass rates ranged from 60%+ and the pattern comprised a mix of Science, Language and Social Science subjects. These were Science (Chemistry & Physics) (68%) followed by (Biology & Chemistry) (63%), French (61%) and then Development Studies (60%). Pass rates at the extremes: 2005 and 2001 appeared most stable as opposed to 2002 and 2004 where studies experienced a greater variation of increasing, decreasing pass rates as well as subjects not being taken for examination. The two Science subjects (Chemistry & Physics) and (Biology & Chemistry) sustained 60%+ pass rates with an increase to 70% for Science (Chemistry & Physics) from 2002 to 2003 while Science (Biology & Chemistry) went up to 74% in 2003 and slightly down to 73% in 2004. French maintained the 60%+ pass rates at the extremes with a decline to 44% in 2002 and no examination was taken on this subject from 2003-4. Development Studies ranked last and sustained 60%+ pass rates for four years; 2002, 2003, 2005 and 2001 while 2004 declined to 55%.

Pass rates ranged from 50%+ in the fifth level and the pattern comprised a variety of subjects including Accounting, History, Practical, Language, Science and Mathematics. Principles of Accounts (55%) achieved the highest pass rate followed by History (002160) (53%), History (002158) (52%), Computer Studies (52%), Literature in English (51%), Biology (50%) and Additional Mathematics (50%). Principles of Accounts achieved 50%+ pass rates throughout the study period with very little variation, followed by History (002158) with 50%+ pass rates for three years 2001, 2003 and 2005. However, the pass rates dropped to 35% in 2002 and 37% in 2004. History (002158) achieved pass rates in a range of 43-48% for four consecutive years: 2001-4. Similarly, Computer Studies achieved unusually low pass rates for four consecutive years: 2001 to 2004 ranging from 9-25%. Besides that Literature in English also achieved the 50%+ pass rates in 2003 and 2005, with a decline slightly below 50% in 2004,

2002 as well as 2001. Biology achieved declining pass rates to a range of 38-43% for four consecutive years from 2001-4, while Additional Mathematics was not taken for examination for three consecutive years from 2002 to 2004 and when it was taken in 2001, it achieved a low of 20% and an increase to 50% in 2005.

Pass rates dropped below 50% in the sixth level and the pattern is a mix of Social Science, Science and Mathematics subjects. These are: Human and Social Biology (49) followed by Mathematics (36%), Chemistry, Economics and Law not taken for examination. Most pass rates were distinctively most unstable with greater variation between 2001 and 2005. Human and Social Biology was the only subject that achieved pass rates from 50-55% between 2002 and 2004 however, these dropped slightly below 50% in 2001 and 2005. Mathematics came second but constantly sustained a range of 31-36% across the years. While Chemistry was not taken for examination in 2003 and 2005, it drastically declined from a range of 13-27% between 2001, 2002 and 2004. The fact that only a smaller percentage of students passed, has confirmed the contention made by the Minister of Finance, Timothy Thahane in his budget speech (2006) that Lesotho will have fewer admissions to those disciplines that need competency in Science and Mathematics (www.lesotho.gov.ls, accessed, 27 April 2006). Economics which was also not written in 2004 and 2005, achieved pass rates far below 50% for three consecutive years: 28% in 2003, 33% in 2002 and 39% in 2001. Law came last and it was also not offered for four consecutive years: 2002-2005, and it achieved a low of 29% in 2001.

Two major patterns, one comprising of practical subjects and the other the next five levels of academic subjects with a mix of one or two practical subjects were identified. Although the patterns were a bit of a mix, practical subjects achieved extraordinarily high pass rates higher than those achieved by academic subjects.

4.2.1 Patterns in Pass Rates in COSC Core Subjects

Although the core subjects still fall within the six levels of performance, the pattern here is somewhat different because there are no practical subjects. Languages achieved the highest pass rate, followed by Science and Mathematics. As opposed to all COSC subjects, core subjects have 4 main subjects namely Sesotho, English, Mathematics and Science which constitutes three subjects differing in the way they are taught. One, three individual specialisations of Physics, Biology and Chemistry, two, a combination of two Science subjects: Physics & Chemistry; Biology and Physics; and Biology & Chemistry and thirdly,

there is a combination of Science subjects: Physics, Chemistry and Biology referred to as Combined Science.

Sesotho falls in level 1: 90%+ achieving the highest pass rates of all the core subjects taken for examination. The next five groups that comprised a mix of English, Mathematics and the Science subjects showed pass rates of 80%+, 70%+, 60%+, 50%+ and below 50% with great variability across the years and these include in addition, that the pass rates dropped between 2001 and 2004 in several groups, and some subjects not being taken between 2003 and 2005 and unusually low pass rates for Science (Chemistry) between 2001 and 2004.

Table 7 Patterns of Pass Rates for COSC Core Subjects

Rank order	Subject	2005	2004	2003	2002	2001
Group 1 – 90% plus	5. Sesotho	93	93	94	90	92
Group 2 – 80% plus	7. Physics	84	61	0	44	41
	9. Combined Science	82	88	88	88	84
Group 3 – 70% plus	11. English Language	76	75	80	76	72
	17. Science (Biology, Physics)	71	30	10	30	76
Group 4 – 60% plus	18. Science (Physics, Chemistry)	68	68	70	70	65
	19. Science (Biology, Chemistry)	63	73	74	68	69
Group 5 – 50% plus	27. Biology	50	43	40	38	38
Group 6 – below 50%	30. Mathematics	36	35	31	34	32
	31. Chemistry	0	13	0	27	25
<p>Source: Examinations Council of Lesotho, Syllabus Grade Analysis Reports: 2001 – 2005</p> <ul style="list-style-type: none"> 0 – Indicates that a subject was not offered in that particular year Red Bold percentiles indicate that students' performance fell short of the standard required (50%) 						

The first level which achieved 90%+ pass rates, showed a pattern where only language subject: Sesotho (93%) which is also a native language achieving the highest pass rates of all the core subjects taken for examination and constantly sustained the 90%+ pass rates across the years with very little variation.

In the second level, pass rates ranged from 80%+ with a pattern comprising exclusively Science subjects: Physics (84%) and Combined Science (82%) in 2005. Although Physics achieved the highest pass rate and was not written in 2003, it improved from a drastic decline of 41% in 2001, 44% in 2002 and 61% in 2004. Combined Science was the only subject that constantly maintained pass rates over 80%+ with the highest stable pass rate of 88% for three consecutive years between 2002 and 2004.

In the third group, pass rates ranged from 70%+ with a pattern comprising a mix of Language and Science subjects. These were English Language (76%) and Science (Biology & Physics) (71%). English Language consistently maintained 70%+ pass rates across the years, with a high of 80% in 2003. Science (Biology & Physics) showed greater variability as it only achieved the 70%+ pass rates in 2001 and 2005 while the pass rates between 2002 and 2004 dropped to a range of 10 – 30%.

The pass rates in the fourth level ranged from 60%+ in 2005 and the pattern comprised exclusively Science subjects: Physics & Chemistry (68%) and Biology & Chemistry (63%). This level was rather more stable as pass rates revealed a combination of Physics & Chemistry keeping up with the 60%+ pass rates across the years and increasing to 70% in 2002 and 2003. Similarly a combination of Biology & Chemistry increased to 74% in 2003 with a slight decrease to 73% in 2004 while maintaining the 60%+ for all the other years.

In the fifth level pass rates ranged from 50%+ and the pattern comprised one Science subject - Biology (50%). The greatest variability in pass rates revealed a steady increase across the years from 38% in 2001 to 50% in 2005.

The sixth level achieved pass rates below 50% with a pattern comprising exclusively Science and Mathematics subjects. Mathematics achieved (36%) and Chemistry was not taken for examination. Although the pass rates in Mathematics have been steadily increasing across the years from 31-36%, they are below 50%. Chemistry was not taken for examination in 2005 and 2003 and when it was, it achieved the worst pass rates: 13%, 25% and 27%. The failure rate in this level was much more intense than in other levels as pass rates revealed a 100% failure rate because all the subjects taken for examination in this group achieved pass rates below 50% implying that only a small number of students passed.

As opposed to all COSC subjects, the patterns of performance differ because there are no practical subjects. The Languages achieved high pass rates higher than those of Science and Mathematics subjects and the patterns are much clearer here as each pattern contains a minimal of one subject or two at a maximum from two different subject groupings.

4.2.2 Pass Rate in COSC Geography - All COSC Subjects and Core subjects

Responding to the research question, “What patterns of students’ performance are found at COSC level particularly in Geography between 2001 and 2005?” findings revealed that in all

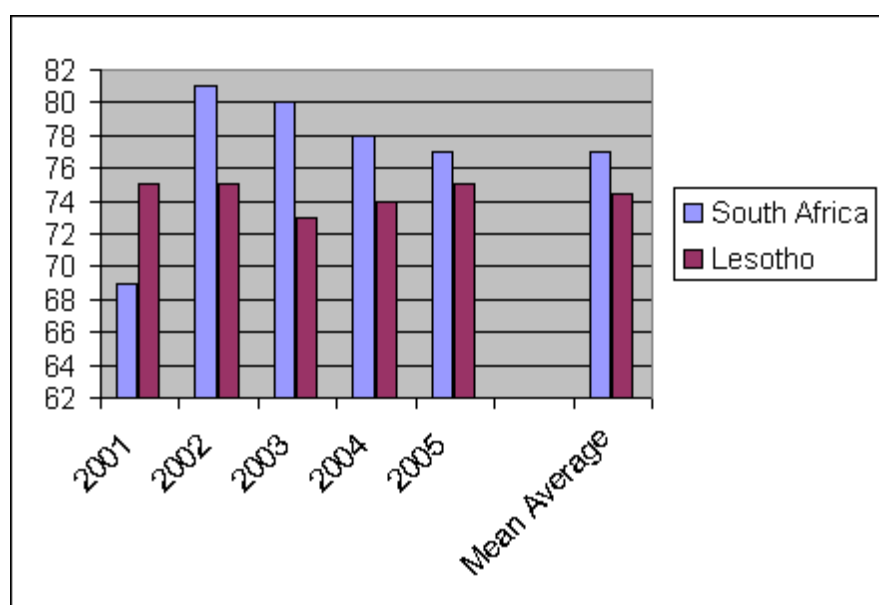
COSC subjects, Geography fell within the 70%+ level where the pattern was a mix of Language, Religion, Commerce and Science subjects. Level 1 (90%+) and level 2 (80%+) outperformed Geography while the next three levels: 60%+, 50%+ and below 50% comprised patterns with a mix of different subject groupings and fell below the pass rates of Geography.

Although Geography is not part of the core subjects, it would locate within Level 3 which comprised of 70%+ pass rates within which the pattern was a mix of English Language and Science (Biology, Physics). Level 1 comprised the 90%+ pass rates with only one Language subject: Sesotho which outperformed Geography as opposed to all the subjects where there were practical subjects with a mix of Sesotho. Level 2 (80%+) which comprised exclusively the Science subjects, also outperformed Geography. The next three levels that followed showed pass rates of 60%+, 50%+ and below 50%, comprised mainly the Science and Mathematics subjects which all fell below the pass rates at which Geography performed as it was the case even with the rank order.

4.2.3 Benchmarking Pass Rates in COSC Geography with Geography in S.A.

Having established the pass rate level of COSC Geography, I wanted to see how it benchmarks with the South African Matric Geography. Findings showed that relative to the S.A. marks, the COSC Geography marks may be lower as shown in Graph 1 below.

Graph 1 Benchmarking Geography in Lesotho against Geography in S.A



Although the South African Matric Geography pass rates were slightly higher than those of COSC with a mean average of 2.6%, they showed some inconsistencies as opposed to COSC Geography which is a consistent performer. South African Matric Geography showed pass rates of 81%, 80%, 78%, and 77% from 2002-5 respectively except for 2001 which showed a low pass rate of 69% lower than COSC Geography. Although the South African pass rates were higher than COSC Geography, they were far lower than those of COSC practical subjects.

Having established that COSC Geography is a consistent performer and that South African Matric Geography has a higher pass rate, the benchmark revealed that they perform more or less similar.

4.3 Concluding Comment

This section discussed the findings on the patterns of students' performance that emerged in all COSC and core subjects for the period 2001-5 within which Geography was located and benchmarked against the South African Matric Geography to establish how it performs in response to the first Research Question: "What patterns of students' performance are found at COSC level particularly in Geography between 2001 and 2005?" Findings showed that, though patterns were mixed, practical subjects achieved high pass rates higher than those of academic subjects with little variation. Languages - Sesotho achieved high pass rate higher than those of Mathematics and Science with little variation from 2001-5 in the core subjects. Geography came out as a consistent performer, locating at level 3 – the 70%+ for all COSC and the core subjects. Benchmarking COSC Geography against the South African Matric Geography also revealed that its pass rates were relatively the same but slightly 2.6% lower. Thus, the perception that there was a decline in COSC Geography performance since 2000 was disconfirmed. Despite the fact that COSC Geography pass rate were relatively well, there were errors that students made in answering Geography examination, and serious measures were needed to correct errors in order to improve performance in COSC Geography.

4.4 Error Analysis

Having seen that Geography performs constantly at 70%+ though exceeded by the practical subjects and that it benchmarks more or less similar to the S.A. pass rate, the focus will be directed on error analysis in response to the second Research Question "What errors do students make in COSC Geography examinations?" Findings revealed that errors fell within

two major categories: Geographical and Non-Geographical. The frequency of common errors within the major categories will be discussed. It will be recollected that out of the two schools in the study, a sample of 43 scripts out of 73 was selected for analysis because they scored less than 50% and 2 Geography teachers were interviewed to confirm/disconfirm the errors.

4.5 Frequency in Categories of Errors

Error analysis highlighted what errors and how often they were made in COSC Geography examination. Frequency is used here to refer to the number of occurrences in which errors occurred in Geography scripts during June 2006. According to the findings Geographical errors were the most frequent relative to Non-Geographical errors as shown in Table 8 below. Geographical errors are errors that result from lack of substantive content knowledge of Geography. Within this category were seven types starting with the most to least frequent: 'Error in content knowledge', 'Error in interpreting graphs', 'Error in calculations', 'Error in applying acquired knowledge', 'Error in reading maps', 'Error in drawing and labeling diagrams' and 'Error in reasoning'. Following these were Non-Geographical errors resulting from technical errors that students made in the examination and these constituted two types: 'Error in interpreting examination questions' was the most frequent, followed by 'Problems with English as a medium'.

Table 8 Frequency of Errors in the June 2006 COSC Geography Examination

Categories of Errors	Frequency
Geographical Errors	
1. Error in Content Knowledge	584 (39%)
2. Error in interpreting diagrams	251 (17%)
3. Error in calculations	219 (15%)
4. Error in applying learnt knowledge	157 (10.4%)
5. Error in reading maps	124 (8.2%)
6. Error in drawing and labeling diagrams	83 (5.5%)
7. Error in reasoning	78 (5.2%)
Non-Geographical Errors	
1. Error in interpreting examination questions	88 (90%)
2. Problems with English as a medium	10 (10.2%)

The researcher did not have an anticipated list of errors but error categories were derived inductively from the scripts, error in content knowledge becoming the most significant.

4.5.1 Frequency in Geographical Errors

Most frequently made errors with regard to Geographical knowledge commence with simple errors in content knowledge of Geography, which is almost twice the two errors succeeding it. Following this were errors students made when interpreting diagrams, in the way they calculated, in the manner in which they applied knowledge, in the way they read maps and less frequently students made errors in drawing and labeling diagrams and when reasoning.

‘Error in content knowledge’ was the first most frequent with the frequency of 584 which almost doubled the next most frequent, ‘Error in interpreting diagrams’. This error occurred when candidates did not remember the geographical knowledge they have acquired to respond correctly to the questions as a result they left some of the questions unanswered and others incomplete. The COSC syllabus provides a course of study to allow candidates to obtain knowledge and understanding however, given the frequency of errors, candidates did not seem to know Geography as much as they should because they did not demonstrate geographical knowledge as it was an expectation.

‘Error in interpreting diagrams’ was the second most frequent error with the frequency of 251 which was slightly below half of ‘Error in content knowledge’. This error occurred when candidates did not read the diagram to convey what they saw into meaningful information. The COSC syllabus regards diagrams, maps and statistics as important ways of representing data and illustrating basic principles and considers essential that candidates be directed towards their interpretation. In spite of these, students still did not demonstrate an understanding of concepts in order to interpret diagrams as required by the question.

‘Error in calculations’ was the third most frequent error with the frequency of 219 which was far below half of ‘Error in content knowledge’. This error occurred when candidates did not perform basic mathematical calculations in Geography. For instance, a question may require them to calculate a diurnal range of temperature or relative humidity. Considering how high the frequency was, it seemed like that candidates did not have a good mathematical background which they needed to transfer to Geography in order to do calculations.

‘Error in applying acquired knowledge’ was the fourth most frequent error with the frequency of 157 which was almost four times the frequency of ‘Error in content knowledge’. This error occurred when students did not put into practice previously learnt Geography principles and procedures to solve unfamiliar problems. This frequency showed that students did not only have difficulty applying the principles but they also did not have knowledge which would serve as a prerequisite.

‘Error in reading maps’ was the fifth most frequent with a frequency 124 which accounted for almost five times the frequency of “Error in content knowledge”. This error occurred when students did not read information from the maps to answer the questions correctly. This frequency served as an indication that students had not yet grasped the basic techniques and principles of map reading as a result answering questions that required map reading skills became difficult.

‘Error in drawing and labeling diagrams’ was the sixth most frequent error with the frequency of 83 which was seven times the frequency of “Error in content knowledge” This error resulted when students did not draw and label diagrams correctly. Despite the fact that the COSC syllabus expects candidates to be able to draw, describe and explain for instance, the use of instruments such as Rain Gauge, Maximum-Minimum thermometer *etc* but they still did not demonstrate this ability.

‘Error in reasoning’ was the seventh most frequent error with the frequency of 78 which was almost eight times the frequency of ‘Error in content knowledge’. This error resulted when candidates responded only to the first part and left out the ‘why’ part of the question which required geographical reasoning. For instance, a question required them to give and account for the features of a Stevenson’s Screen. In responding to this question, they gave the features without accounting for them. It appeared here that students were not in a position to reason because they did not say why things were the way they were.

In this section I discussed the frequency of Geographical errors. Although seven categories of errors within this major category were identified, error in content knowledge had the highest frequency of errors higher than those that succeeded it.

4.5.2 Frequency in Non-Geographical Errors

Non-Geographical errors showed two types: ‘Error in interpreting examination questions’ being the most frequent, followed by ‘Problems with English as a medium’.

‘Error in interpreting examination questions’ was the first most frequent error with the frequency of 88. This error occurred when candidates did not get the correct meaning of the question and ended up interpreting it in a manner that made sense to them and ultimately provided an incorrect answer.

‘Problems with English as medium of instruction’ was the last frequent non Geography factor with a frequency of 10 which contributed to the declining performance. Candidates struggled to express their thoughts in a manner that was clear and sensible to the reader. Their grammar was poor and they had difficulty constructing proper sentences. Although the error frequency was very small, it was worrying that some students still made grammatical errors and struggled to construct proper sentences when responding to questions at their level.

4.6 Common Geographical and Non-Geographical Errors

Having established that Geographical errors exceed Non-Geographical errors in terms of frequency, I will discuss common errors within the two. Commonly made errors in Geographical knowledge commenced with errors students made in Physical Geography which were more than errors made in Human Geography and Map Reading. Table 9 below shows these errors ordered in terms of how common they were made by the students.