

Structure of Ordinary Level (O/L) Biology Paper Two and Candidates' Performance in O/L Biology in the General Certificate of Education (GCE)

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Abstract: Survey was used to carry out the study on “structure of ordinary level (O/L) biology paper two and candidates’ performance in O/L biology in the General Certificate of Education (GCE)”, following changes in the structure of the examination since the June 2017 session. By means of direct delivery technique, a questionnaire with 8 close ended items was used to collect data from 125 o/l biology examiners in a population of 180 of them. By means of Spearman Rank correlation, the data was analyzed inferentially. The results show that the structure of ordinary level biology paper two has a significant effect on candidates’ performance in ordinary level biology in the General Certificate of Education (GCE). From the findings, it is recommended that in ordinary level biology paper two, candidates could be asked to answer your questions of their choice out of a total of eight questions, that candidates may not be compelled to answer any particular question(s) in paper two, and that each of the eight questions could carry equal marks.

Keywords: Structure of ordinary level biology, paper two, candidates’ performance

Introduction

An objective of education as stated in section 5 of Law N° 98/004 of 14 April 1998 on education in Cameroon, is to promote hygiene and health education. It is probably for this reason that “health education” is one of the subjects in the primary school syllabus in English-speaking Cameroon (MINEDUB, 2018). Besides “health education”, the primary school syllabus in English-speaking Cameroon has another subject called “environmental science”. Both health education and environmental science deal with issues concerning biology, although biology as a subject does not appear in the syllabus for English-speaking primary schools in Cameroon.

In English-speaking Cameroon, biology is subjects in the syllabus for secondary grammar colleges. Therefore, students of secondary grammar education in English-speaking Cameroon meet biology as a subject only when they get to secondary school. According to Mbelle, Mainzde and Bongwa (2014), biology is the study of living things. Orock, Besong abd Ntaribo (n.d) opine that biology is the study of living things and their environment.

According to section 16 (2) of Law N° 98/004 of 14 April 1998, secondary education in English-speaking Cameroon shall comprise of two cycles; first cycle and second cycle. The first cycle of five years has an observatory sub-cycle of two years and an orientation sub-cycle of three years. The second cycle is for two years. Section 18 of Law N° 98/004 of 14 April 1998 adds that certificates shall be issued at the end of the first cycle of secondary education, and that promotion to the second cycle of secondary education shall require obtaining the end of first cycle certificate. At the end of the first cycle (five years) in secondary grammar schools in English-speaking Cameroon, students are expected to write

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the Ordinary Level (O/L) examination at the General Certificate of Education (GCE). GCE O/L is therefore an end of course examination in which successful candidates are issued certificates. At the Ordinary Level, candidates who pass in four or more subjects are issued the Ordinary Level Certificate. This O/L certificate is a prerequisite for admission into the second cycle. It is therefore the hope of biology students, biology teachers, and other education stakeholders, that biology is among the subjects that candidates pass in at the Ordinary Level.

Biology is done from form one in secondary grammar schools in English-speaking Cameroon. According to the Cameroon General Certificate of Education (GCE) Board (2015), the O/L GCE syllabus is to be done within the orientation sub-cycle of three years of general education. Therefore, the syllabus begins in the third year (form Three) and runs through the fifth year (form five). The biology syllabus for GCE O/L therefore begins in form three and runs through form five. Biology is a compulsory subject in most secondary grammar schools for forms one to five students. However, some secondary grammar schools or colleges leave it optional for form five students prior to their registration of the GCE examination.

Candidates, who pass in biology at the Ordinary Level, could choose to study biology at the Advanced level, thereby giving them the opportunity to study disciplines like microbiology, biochemistry, zoology, and botany in higher education. In Cameroon, biology is a prerequisite to the study of professions like medicine, pharmacology and agriculture. The study of biology also enables students to better take care of their personal and community hygiene as well as educates them on foods and their nutritional value.

In Cameroon, the role of teachers to teach and to carry out assessment is stated in section 39 of Law N° 98/004 of 14 April 1998. It is therefore the responsibility of biology teachers to teach biology to their students and prepare them for the Ordinary Level biology at the GCE. It is therefore the concern of biology teachers that after teaching biology, students (prospective O/L GCE candidates) should learn adequate biology that will enable them obtain pass at the GCE Ordinary Level.

Section 37 of Law N° 98/004 of 14 April 1998 also states that the teacher is the principal guarantor of the quality of education. At the GCE Ordinary Level, the quality of biology education is likely assessed not only in terms of the number of candidates who pass biology at the ordinary level of the GCE, but also in terms of the number of candidates who pass in "A" grade and to a lesser extent, the number that pass in "B" grade. This further buttresses the concern of biology teachers on the biology that they teach, the biology that students learn and on the performance of candidates in biology at the GCE Ordinary Level.

Background of the Study

The West African School Certificate Examination in West Africa was replaced by the London General Certificate of Education in 1964 (Tambo, 2003). According to Tambo (2003), London General Certificate of Education was replaced by Cameroon General Certificate of Education in 1977. In 1993, the government of Cameroon created the Cameroon General Certificate of Education Board. This board was charged with the responsibility to organize examinations at both the Ordinary and the Advanced Level. Biology is one of the subjects written in the GCE, by students of secondary grammar colleges. Fifth year students in secondary grammar schools or colleges are expected to write GCE Ordinary Level biology. The examinations in two parts: paper one and paper two. Both

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papers are compulsory with paper one and two making 40% and 60% respectively in the entire examination.

Prior to 2009, paper one was made up of short-answered structural questions and the questions were all compulsory. Paper two was made up of eight essay questions; four in section A and four in section B. Candidates were requested to answer your questions, choosing two questions from each section. Teachers and prospective candidates could choose and pick topics that they will teach/learn with the hope of choosing questions in paper two.

In 2009, the structure of O/L biology paper one at the GCE was changed from short structural questions to multiple choice questions (MCQs), following a decision from the minister of Secondary Education, that introduced MCQs in GCE examinations at both Ordinary and Advanced Levels. In spite of this change in the structure of paper one, it still maintained its weighting 40% in the GCE. Ordinary Level biology paper two maintained its structure of being in two sections: section A and section B. Each of the sections contained four questions and candidates were requested to answer two questions in each section. Paper two also maintained its weighting of 60% in the GCE.

Biology at Ordinary Level (O/L) of General Certificate of Education (GCE) experienced another structural modification in 2017. The registrar of the GCE Board announced that biology paper two at the O/L will henceforth be made up of five compulsory essay questions and not eight essay questions for candidates to choose four as it had been the usual practice. Worthy of note is the fact that this modification was only for O/L biology. Other subjects at both Ordinary and Advanced Levels maintained the same structure of their examinations; giving candidates the opportunity to choose a few questions out of a variety of questions. The change in structure of O/L biology paper two did not have any corresponding change in the O/L biology syllabus.

According to Ornstein and Hunkins (2009), curriculum development is the responsibility of an Examination Board. This responsibility is also in section 11 of Law No 98/004 of 14 April 1998 that lays down guidelines for education in Cameroon. However, both students (prospective GCE candidates and teachers took the decision of the registrar with mixed feelings given that by implication, both the students and the biology teachers were to leave no stone un turned. Teachers and prospective candidates had to do all within their means to finish the syllabus in record time so as to adequately prepare the candidates for the examination. The five compulsory questions in paper two and the fifty compulsory MCQs in paper one could come from any section of the syllabus.

In Cameroon, Law No 98/004 of 14 April 1998 states that teachers shall be bound to teach. Therefore, irrespective of the nature of the O/L biology syllabus, irrespective of the structure O/L biology paper two at the GCE, biology teachers shall be bound to teach biology students in a bit to adequately prepare them for the GCE. This study seeks to investigate the effect of the changes in structure in O/L biology paper two on the candidates' performance at the GCE.

Statement of the Problem

The syllabus for O/L biology prescribes biology subject matter that students are expected to acquire before writing O/L biology at the GCE. After interactions between biology teachers and biology students, the students are expected to succeed in any biology examination at their level, including the Ordinary Level General Certificate of Education (GCE) examination.

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Statistics show that for the past couple of years, the performance of candidates in biology at the Ordinary Level of the GCE has been low. Poor performance in Ordinary Level biology may hinder students from studying biology in the high school. This may further hinder students from pursuing further studies in biology and biological sciences as well as hinder them from studying professions that have links with biology such as medicine, pharmacology, and agriculture.

Apart from teaching and learning, the structure of the examination and more precisely paper two of the examination may be contributing to this relatively poor performance. This study investigates the effect of the structure of biology paper two at the Ordinary Level GCE on candidates' performance.

Objective of the Study

To find out the effect of the structure in O/L biology paper two at the GCE on candidates' performance in ordinary level biology.

Research Question

What is the effect of the structure of O/L biology paper two at the GCE on candidates' performance in ordinary level biology?

Ordinary Level Biology Syllabus

According to GCE Board (2015), the aims of biology at the ordinary level is to enable students have basic knowledge of living organisms and their environment for better survival even if they do not proceed biology. The aims are also to prepare students for advanced level and professional courses, to enable students recognize the value of experimental skills in the study of biology, and to encourage respect for all living organisms.

The GCE Board adds that the objectives of the examination will test the following attributes:

- Knowledge and understanding of biological facts, terms, principles, concepts, relationships and experimental techniques;
- Knowledge and understanding of the social and environmental implications, the economic and technological applications of modern biology;
- Inter-relationships between various areas of biology, in particular, the relationship between structure and function;
- Ability to make accurate observations of living materials and preparations;
- Ability to assess and interpret simple biological experiment and data; and
- A working knowledge of those portions of chemistry, physics and mathematics which are necessary for a proper understanding of biology at this level.

The syllabus is divided into three main sections; nature and variety of living organisms, functioning of living organisms, and environmental biology and human activities. Nature and variety of living organisms deals with nature of living organisms and variety of living organisms such as viruses, bacteria cell, filamentous green alga, plasmodium, mould fungus, bony fish, reptiles, birds, housefly, social insect, monocotyledonous plant, herbaceous leguminous plant and a mammal other than man. Functioning of living organisms has to do with nutrition, respiration, transport, excretion, coordination, and reproduction and genetics. Environmental biology and human activities is concern with environmental biology and use

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of biological resources. Each of the topics mentioned above contains a number of lessons that are to be taught and learnt by biology teachers and ordinary level biology candidates respectively.

It is based on this syllabus that ordinary level biology candidates had to choose four questions out of eight in paper two at the GCE before 2017. It is the same syllabus that ordinary level candidates had to answer five compulsory questions in biology paper two from the June 2017 session.

Structure of Ordinary Level (O/L) Biology Paper Two

Biology paper two at the ordinary level of the GCE is made up of essay type questions. The questions are from the entire syllabus for ordinary level biology as spelt out in the syllabus and regulations of the GCE by the GCE Board (2015). Before 2017, paper two biology at the ordinary level was made up of two sections; section A and section B. Each of the sections was made up of four questions. Candidates were instructed to answer your questions, choosing two from each section. Therefore, candidates were instructed to choose and answer four essay questions out of eight.

In 2017, the Registrar of the GCE Board announced a change in structure in ordinary level paper two. The change which took effect from the June 2017 session indicated that ordinary level biology paper two was made up of five essay questions and not eight as it had been before. The five essay questions were not separated into two sections as it was the case previously. Another major change was the fact that the five essay questions were all compulsory as opposed to the previous situation with eight questions for the candidates to answer four. Other subjects like economics, history and geography did not experience any change and candidates continued to choose their questions among a variety of questions.

General Certificate of Education (GCE)

This examination came into being in 1964 when it replaced the West African School Certificate Examination (Tambo, 2003). Then, the examination came from London and was called London General Certificate of Education. Cameroon took over the examination from London in 1977 and titled it as Cameroon General Certificate of Education. Tambo (2003) attested that the government of Cameroon created the General Certificate of Education Board in 1993. Ever since its creation, the GCE Board has been in charge of organizing and running GCE examinations.

The GCE Board organizes and runs examinations in two levels; The ordinary level examination is for the first cycle and the advanced level examination is for the second cycle. Biology is one of the subjects written at the ordinary level for students offering secondary grammar education.

The objective of an examination is to measure the performance level of students or candidates (Rasul, 2011). Seemingly, the objective of ordinary level biology at the GCE is to measure the performance level of the candidates in biology. Shahid (2007) adds that an examination is well planned in order know whether or not candidates have had a certain level of knowledge. It is probably for the same reason that candidates write biology at the ordinary level of the GCE, to know whether candidates have attained a certain level of knowledge in biology. Nyamwange, Ondima and Onderi (2013) attest that an examination measures teachers' effectiveness in teaching his/her subject matter. It is therefore the concern of biology teachers

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who double as examiners, to ensure that the students/candidates are adequately prepared for the examination, since it is also a measure of their effectiveness.

Methodology

This study used the quantitative research approach, by means of the survey design. The study was carried out in the Republic of Cameroon that is made up of ten regions namely; Adamawa, Centre, East, Far North, Littoral, North, North West, West, South, and South west. Each of these regions is made up of towns and villages endowed with a number of public, confessional, and lay-private secondary grammar colleges whose students offer biology at the ordinary level of the GCE. Ordinary level biology examiners come from the various secondary grammar colleges in the different villages and towns in all the ten regions of the Republic of Cameroon.

The accessible population was made up of 125 ordinary level biology examiners, got by random sampling. The examiners were invited by the GCE Board from all the ten regions of the country. Given that they mark the ordinary level biology paper two, they were better placed to assess the performance of the candidates at least in that paper.

Likert-type items in the questionnaire were analyzed by means of Spearman Rank Correlation, in order to investigate whether there is a relationship between the variables or not. The p-value was compared with the alpha value of 0.05 to investigate whether there was a relationship or not, and whether to reject or accept the null hypothesis.

Findings

Findings on the structure of ordinary level (O/L) biology paper two and candidates' performance in biology at the GCE examination are presented below:

Presentation of findings based on structure of ordinary level biology paper two at the GCE examination.

<i>Items</i>				
	SD	D	A	SA
Candidates attempt all the compulsory questions in paper two as they are instructed	20 (16%)	62 (49.6%)	28 (22.4%)	15 (12%)
	82 (65.6%)		43 (34.4%)	
Candidates have a pass mark in each of the compulsory questions attempted in biology paper two.	12 (9.6%)	92 (73.6%)	15 (12%)	6 (4.8%)
	104 (83.2%)		21 (16.8%)	
Candidates have an overall pass mark in biology paper two following the compulsory questions attempted	15 (12%)	65 (52%)	32 (25.6%)	13 (10.4%)
	80 (64%)		45 (36%)	
Candidates' performance in biology paper two does not play a major part in their overall performance in	46 (36.8%)	79 (63.2%)	0 (0.0%)	0 (0.0%)

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biology at the GCE	125 (100%)		00 (0.0%)	
A pass in biology paper two does not guarantees a pass in biology at the GCE	18 (14.4 %)	83 (66.4 %)	24 (19.2 %)	0 (0.0%)
	101 (80.8%)		24 (19.2%)	
Candidates perform well if questions are made compulsory in biology paper two at the GCE	32 (25.6 %)	84 (67.2 %)	8 (6.4%)	1 (0.8%)
	116 (92.8%)		9 (7.2%)	
Candidates are more motivated to write ordinary level biology if all the questions in paper two are compulsory	29 (23.2 %)	50 (40%)	35 (28%)	11 (8.8%)
	79 (63.2%)		46 (36.8%)	
The performance of candidates in biology paper two was better when they had five compulsory questions than when they had to choose four questions out of eight.	18 (14.4 %)	107 (85.6 %)	0 (0%)	0 (0%)
	125 (100%)		00 (0.0%)	
Total	185 (18.1 %)	566 (55.4 %)	214 (20.9 %)	57 (5.6%)
	751 (73.5%)		271 (26.5%)	

Most examiners (65.6%) were in disagreement that candidates attempt all the compulsory questions in biology paper two as they are instructed. However, some examiners (34.4%) were in agreement that candidate's attempt all compulsory questions in biology paper two as instructed.

A large majority of examiners (83.2%) did not share the view that candidates have a pass mark in each of the compulsory questions attempted in biology paper two. A handful of examiners (16.8%) thought that candidates have a pass mark in each of the compulsory questions attempted in biology paper two.

Most examiners (64%) were not of the opinion that candidates have an overall pass mark in biology paper two following the compulsory questions attempted. A few examiners (36%) were of the opinion that candidates have an overall pass mark in biology paper two following the compulsory questions attempted.

All the examiners (100%) contested the view that candidates' performance in biology paper two does not play a major part in their overall performance in biology at the GCE. No examiner (0.0%) said that candidates' performance in biology paper two does not play a major part in their overall performance in biology at the GCE.

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A comfortable majority of examiners (80.8%) were in disagreement that a pass in biology paper two does not guarantee a pass in biology at the GCE. A few examiners (19.2%) were in agreement that a pass in biology paper two does not guarantees a pass in biology at the GCE.

About nine out of ten examiners (92.8%) did not agree that candidates perform well if questions are made compulsory in biology paper two at the GCE. Very few examiners (7.2%) were in agreement that candidates perform well if questions are made compulsory in biology paper two at the GCE.

Most examiners (63.2%) did not share the view that candidates are more motivated to write ordinary level biology if all the questions in paper two are compulsory. Some examiners (36.8%) held the view that candidates are more motivated to write ordinary level biology if all the questions in paper two are compulsory.

All examiners (100%) held a contrary opinion that the performance of candidates in biology paper two was better when they had five compulsory questions than when they had to choose four questions out of eight. No examiner (0.0%) opined that the performance of candidates in biology paper two was better when they had five compulsory questions than when they had to choose four questions out of eight.

Generally, about three quarters of examiners (73.5%) attested that the structure of ordinary level biology paper two has an effect on the performance of candidates in ordinary level biology at the GCE. They said the effect is negative when all questions in biology paper two were compulsory as opposed to when candidates were asked to answer your questions out of eight. About one quarter of examiners (26.5%) held a contrary view. To them, the structure of ordinary level biology paper two does not have an effect on the performance of candidates in ordinary level biology at the GCE.

The correlations according to Spearman's rho indicated that the Sig. (2-tailed) or p-value is less that the alpha (α) value of 0.05, indicating that the null hypothesis is rejected and the alternate hypothesis accepted. Therefore, in this study, the null hypothesis is rejected and the alternate hypothesis accepted, implying that there is a significant relationship between the structure of ordinary level biology paper two and candidates' performance.

Conclusion

Many candidates did not attempt all the five compulsory questions in biology paper two in the GCE O/L. Many candidates did not have a pass mark in the compulsory questions that they attempted in ordinary level biology paper two at the GCE. As a consequence, many candidates did not pass in ordinary level biology paper two at the GCE. Candidates' performance in biology paper two had a significant effect in their overall performance in biology at the ordinary level of the GCE.

Recommendations

It was recommended as follows:

1. In ordinary level biology paper two, candidates could be asked to answer four questions of their choice out of a total of eight questions.
2. Candidates may not be compelled to answer any particular question(s) in biology paper two.
3. Each of the eight questions in ordinary level biology paper two could carry equal marks.

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