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The Effects of the Cooperative Learning Method on the Development of Higher Order Thinking Skills (HOTS) in Practical Geography in High School Students in Fako Division of the South West Region of Cameroon

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Abstract

The study was a quantitative study aimed at investigating the Effects of Cooperative Learning Method on the Development of Higher Order Thinking Skills (HOTS) in Practical Geography in high school students of the Fako Division (South West Region) of the Cameroon. Four specific objectives were formulated. The study made use of the cross- sectional design which comprised of a quasi-experiment of pre-test/post-test control and experimental groups and an observation checklist. The research targeted 1,993 students in 28 high schools from the Buea Subdivision of the Fako Division. An intact Lower sixth class of 100 students of Government Bilingual High School (GBHS) Soppo in Buea Sub Division was used as the sample. A General Certificate of Education (GCE) Advanced Level Standard Test comprising of HOTS questions was administered through a pilot test with reliability coefficient of 0.68. All four null hypotheses were tested using the independent T-test stated at $p \leq 0.05$ level of significance. Findings from the analysis of the quasi-experiment revealed a significant difference in the acquisition of HOTS between students taught practical Geography using the cooperative learning method and those taught using the traditional lecture method. Findings obtained from the observation checklist revealed that the cooperative learning method had a significant effect on the development of students' HOTS in practical geography. Based on these findings, it was recommended that teachers should adopt the cooperative learning method as an alternative teaching strategy in enhancing HOTS development in high school students of the Fako Division.

Keywords: Positive Interdependence, Individual Accountability, Group Processing, Higher Order Thinking Skills, Practical Geography

Introduction

Delor (1996) [11] asserts that 21st century education should be guided by four pillars which are learning to know, learning to do, learning to be and learning to live together in peace. It is within this framework that since 1992, UNESCO has embarked on promoting education for sustainable developments (ESD) to help countries restructure their curriculum in order to enable learners acquire Higher Order Thinking Skills (HOTS) (Brookhart, 2010; Nofron & Wijayanto, 2018) [9, 16]. The achievement of HOTS by learners in different communities in the world is fundamental because it enables them to adequately understand and solve complex problems around them. With HOTS learners around the world can easily recall, restate, recite, apply, connect, or manipulate prior knowledge in order to effectively solve new problems in the 21st century (Brookhart, 2010; Superno *et al*., 2019) [9, 20]. When students achieve HOTS they can present solid opinions, introduce consistent arguments and demonstrate critical thinking, the acquisition of HOTS prepares the competence of the students to meet 21st century challenges, fosters a sense of care about the region or country since HOTS learning is mostly concerned with contextual issues about the environment (Supeno. *et al*, 2018).

Practical Geography is a branch of Geography where students engage in hands-on skills. Major aspects of practical geography include map work, field work and statistical techniques. The development of HOTS is very fundamental in understanding practical geography. When students are familiarized with HOTS in fieldwork, they can solve new problems and challenges, acclimatize themselves in new atmosphere and can make decisions about a particular problem in their environment (Retnawati *et al*, 2018) [17]. With HOTS students can easily interpret and analyze human and physical features on a map and draw reasonable conclusion. The acquisition of HOTS in statistical technique will enable the students to overcome challenges in this new age where there is too much information flow but limited time for processing (Superno, *et al*, 2018).

One of the major objectives of Education in Cameroon as laid down in Law No 98/004of 14 April 1998 is to promote, "the Development of creativity, a sense of initiative and the spirit of enterprise". However, this objective which requires the use of HOTS is far from being realized in geography in general and practical geography in particular especially in High schools in Fako Division. This is due to the fact that students can hardly apply what they have learned in school in "new" context. Many reasons may account for this; prominent amongst them is the teaching method. The teaching of geography in schools in Fako division is dominated by the teacher centered lecture method which has rather led to rote learning (Alemnge & Andongaba, 2021). There is therefore an urgent need for a paradigm shift from this teacher-centered teaching approach to a student-centered approach like the cooperative learning method which can have a positive effect on HOTS. This study therefore seeks to show the effect of the cooperative learning method on the Development of HOTS in Practical Geography in High school students in Fako Division. This chapter examines the background to the study, the statement of the problem, the objective of the study, the research questions, the hypotheses, the justification of the study, the significance of the study, the scope of the study and the operational definition of key terms.

Contextually, the prevailing situation in Cameroon Classrooms in general and Fako Division in particular shows that many social science teachers are still using the teacher centered approach in teaching (Alemnge & Andongaba, 2021). The most widely used of these methods is the lecture, recitation, note copying and textbook acting (MINESEC/IGE/IP-SS, 2019) [14]. Several scholars have argued that these teacher-centered methods which consider the teacher as a reservoir of knowledge are very ineffective especially in the development of HOTS. This is because when the students are not directly active in the teaching process, very little learning takes place. The use of these methods in Cameroon schools has not only led to high failure rate in practical geography but has equally caused many students to dread the subject (MINESEC/IGE/IP-SS, 2019) [14]. Considering these lapses, a new high school geography curriculum was developed and introduced in 2019. This syllabus recommends an array of teaching methods that can be applied in classrooms especially in the teaching of geography. Most of the methods recommended in the new syllabus are student-centered methods which include; discussion, brainstorming, role-play /simulation; group work; lecture/ analyses of documents; presentation and interviews; The argument that the curriculum planners have been advancing is that if the student-centered methods are used, they will help improve performance and are also going to raise the required skills that can improve competence (MINESEC/IGE/IP-SS, 2019) [14].

The continuous and persistent used of the teacher centered method in Cameroon schools have resulted from factors such as; large class sizes which are generally above 60 students per class, the incompetence of most teachers in applying the student-centered method especially in some lay private schools, mission schools and schools in rural areas, the narrowing down of learning objectives to passing exams, inadequate resources available for teaching, the old perception of a teacher as a reservoir of knowledge and also the fact that the learner -centered approach especially cooperative learning is time consuming (Tambo, 2012; Chemisa, 2013) [21, 10]. The result is that learners have been reduced to silent or passive listeners and this has led to poor development of HOTS and incompetence which often result in poor performance in internal and external examinations. As such, many students tend to dread geography especially practical geography which is supposed to be a lively branch due to its practicability. It is against this backdrop that this study seeks to show the effectiveness of the cooperative learning method (which is one of the recommended students-centered learning method) of teaching practical Geography in the Development of Higher order thinking skills in high school students in Fako Division.

Statement of the Problem

Practical Geography is aspects of geography that equips learners with skills that can enable them better apply the theoretical concepts in physical and human geography by directly carrying out activities in map work, statistical techniques, and field work. This implies that practical geography requires HOTS.

Generally, the acquisition of HOTS enhances students' ability to present facts systematically, manipulates information conveniently, argue consistent and also raises their critical thinking skills (Brookhart, 2010) [9]. Unfortunately, the post assessment report of Geo 0750 of the Cameroon General Certificate of education (CGCEB) indicates that many high school geography students in Fako Division find it difficult to interpret, describe and critically analyze human and physical features on maps, measure calculate and sketch the patterns of these features. They also are unable to establish the significance of the relationships between them. Moreover, they find difficulties summarizing data statistically by calculating central tendencies and measuring dispersions and associations. Even worse, they are incapable of constructing and interpreting graphs and above unable to manipulate and present information on maps (Nkemngong, Yuh & Nshaga, 2021) [15].

The consequences to these are that, student tend to resent practical geography and at the General Certificate of Education/ Advanced Level where 70% of the questions require the use of HOTS, many of them have been underperforming (Nkemngong, Yuh & Nshaga, 2021) [15]. These challenges can be blamed among other factors, on the teaching method that is used in the classrooms. In Fako Division, classrooms are generally, overcrowded; resources are limited, teaching time is insufficient and as such the teacher centered method particularly the lecture method is dominating (Alemnge & Andongaba, 2021). This method has proven to be ineffective in raising students' HOTS since it is largely teacher-centered (Gilles & Boyles, 2009).

In a bid to address this problem, there is a need to investigate a more learner- centered approach especially the cooperative learning method which some scholars argue that it can effectively improve HOTS. (Oxford, 2014). It was for this reasons that this study was conducted to show the effects of Cooperative Learning Method on the development of HOTS in Practical Geography in high school students in Fako Division.

Objectives of the Study

The purpose of this study was to find out the effect of the cooperative learning method on the development of Higher Order Thinking Skills (HOTS) in Practical Geography in high school students of the Fako Division.

The specific objectives of this study were to:

1. Determine the differences in the development of HOTS of high school students who are taught practical geography using the cooperative learning method and those taught using the lecture method.
2. Ascertain the effect of positive interdependence on the development of HOTS in Practical Geography in high school students.
3. Examine the effect of individual accountability on the development of HOTS in Practical Geography in high school students.
4. Find out the effect of group processing on the development of HOTS in practical geography in high school students.

Justification for the Study

The purpose of this study was to examine the use of cooperative learning in the teaching of Practical Geography and the development of Higher Order Skills (HOTS) in high school students in Fako Division. The use of cooperative learning has been examined by different researchers in mathematics, reading and composition and pure sciences and found to be very effective in the development of required skills (Slavin, 1995; Mevarech, 1985) [19, 13]. However, very little research has been carried out on the effectiveness of cooperative learning in social sciences in general and Geography in particular. This is especially against a background in which the curriculum of Geography is shifting from purely descriptive lessons to thematic and practical lessons. Moreover, many teachers continue to use the direct teaching strategy which is more effective in descriptive lessons but has proven to be less effective in practical lessons especially because such lessons require the use of HOTS.

As the traditional teaching method continues to prove ineffective in raising required HOTS in Practical Geography, there is a need to try an alternative teaching approach such as the cooperative learning method which is a learner centered approach. It is believed that the use of the cooperative learning method will greatly enhance the acquisition of these HOTS in Practical Geography if not the learners will continue to suffer when confronted with tasks that require the application of HOTS.

Even though this study, due to its complexity, required time and resources to realize, the findings obtained has the potential of being exploited and used by governments, nationals, international educational agencies and other educational stakeholders in charge of curriculum development. Even the students that took part in this study can also reap benefits from it by adopting effective learning strategies which would enable them to respond to the exigencies of the 21st century understanding and implementation of geographic knowledge when they leave school.

Significance of the Study

The study would be of enormous benefit to a cross section of educational stake holders including students, geography teachers, the school administrators, pedagogic inspectors, examination boards, training institutions and curriculum developers.

Within the internal school environment, cooperative learning would greatly help students improve their critical thinking skills through their interaction with peers. As such this would greatly enhance their performance in examination. It would also lower the fear factor and give learners self-confidence as they work with their peers. In addition, it is going to improve on their reading and research skills especially as they are going to be the main actors in the teaching learning process. On the part of the teachers, it will push them to modernize their teaching from the traditional teacher- centered to a student-centered approach. Complementary to this, cooperative learning would help the teacher reduce his/her workload and also give them the chance to gain new knowledge from the students. As far as the school administrator is concerned Cooperative learning will facilitate the management of limited resources put at their disposal. This is because in cooperative learning the students are required to work as a group rather than as individuals. As such, the few resources in school can be effectively shared and used by the groups.

For the other external stakeholders such as the inspectors, the study would help them acquire new learning strategies to teach and supervise other teachers during in-service training. Also, for examination boards, the study is going to help them to reconsider their evaluation strategy and if possible, implement group testing and award group marks. It would also be of use to teacher training institutions, they will acquire new techniques in cooperative teaching which would enhance the training of student-teachers on strategies to implement this method in the field. Curriculum planners will benefit from it to design and recommend cooperative learning as an effective method of teaching practical geography as the findings from this study seek to prove cooperative learning is an efficient method of developing HOTS.

Scope of the Study

The study is delimited geographical wise and content wise. Geographically, it is limited to secondary schools in Fako Division. Content wise it is limited only to the use of cooperative learning method as a pedagogic method in developing students' HOTS in Practical Geography. It considers only positive interdependence, individual accountability, and group processing as the indicators of cooperative learning. It centers only on analysis, evaluation and syntheses as the indicators of HOTS. In the same light, Practical Geography is limited to map work and statistical techniques in geography. The study is also delimited theoretically to the Social Learning theory by Bandura (1977), the theory of Social Interdependence by Deustch (1949), the Bloom Taxonomy Theory by Bloom (1956) [8] and the meaningful verbal learning theory by Ausubel (1960). Methodologically, it limits itself to the cross-sectional research design involving the use of a quasi-experiment and an observation checklist. The sample size involves only one intact lower sixth class of 100 students in government bilingual high school Great Soppo in Buea sub division of the Fako division.

Research Design

The cross-sectional research design was used. This is a research approach in which the researchers investigate the state of affairs in a population at a certain point in time (Bethlehem, 1999) [7]. In this study a quasi-experiment of pre-test post-test control/ experimental groups was conducted on a population while at the same time carrying out an observation using an observation checklist on the

same population. A quasi-experiment is one in which participants are not randomly assigned to groups. It is made up of two groups, the control group (this is denoted by R) which is not administered to a special treatment and an experimental group (denoted by T) which is administered a special treatment or intervention (Skidmore, 2008) [18]. The two are pretested to determine their differences on the outcome measure after which treatment is given to one of the groups (the experimental group) a post test is given to the two groups to determine the outcome (Amin, 2005) [1]. This design was conceptualized in this study to correspond to the passage of time as seen below.

Experimental Group (T) O_1 T O_2
Control group (R) O_1 O_2

Where O_1 represents the pretest, T represent treatment and O_2 represent Post –test.
The Observation checklist was used at the same time to determine the level of cooperation within the groups. In this case, an observation checklist bearing the indicators of the three elements of Cooperative Learning used in this study which are; Positive Interdependence, Individual Accountability and Group Processing were established for this purpose.

Area of the Study
The area of the study was Fako Division. This is one of the six Divisions that make up the South West Region with headquarters in Limbe. It was created on 27th of June 1977 by presidential decree No 77/203. It covers a surface area of 2093 km2. Administratively, the Division is divided into six sub divisions which are Limbe Urban made up of Limbe 1, Limbe 2 and Limbe 3; Buea Sub-Division, Muyuka Sub-Division, Tiko Sub Division and West Coast Sub-Division. Data collected from the Divisional Delegation of Secondary Education in 2020 showed that, there are 71 Secondary High schools in Fako Division that provide General Education of which 24 are public, 19 confessional and 28 are lay private with a total enrolment of about 14196 students. Many primary, secondary and tertiary institutions of learning also exist in the Division with the University of Buea being the only public University. This area was chosen for this research, first because it accessible and secondly because it hosts more than 2/3 of the high school population in the South West Region.

Population of the Study
There are a total of 71 high schools in Fako Division of which 28 are found in Buea Subdivision. The total number of Geography students in Fako Division stood at 5,534of which 1,993are found in Buea Subdivision.
The study population or accessible populations comprised of all 152 high school geography students of Government Bilingual High School Great Soppo Buea as seen on Table 1 below:
The sample frame comprised of 100 Lower sixth students of GBHS Soppo as seen on Table 1 below:

Table 1: High School Geography Students of Government Bilingual High School Great Soppo for 2020/2021 Academic Year

Class	Total Number of Geography Students	Male	Female
Lower Sixth	100	23	77

Source: Adapted from the enrolment obtained from GBHS Great Soppo for the academic year 2020/2021

Sampling Procedure
The population of this study comprised of High School Geography students in Fako Division. Lower sixth students were used for the study. To ensure that the students were operating at the same level, an intact lower sixth class of GBHS Great Soppo, Buea Subdivision was used for the study. The students were split into two equal groups. One group served as the experimental group and the other as the control group. The class teacher of the control group taught the lessons normally using the traditional lecture method while the researcher with the help of two research assistants directed the experimental group on what was expected from them with respect to cooperative learning method.
Six topics were selected from the high school syllabus for the study from the areas of map work and statistical techniques. Lesson plans for the six topics were drawn up in 2 pairs each, one with the traditional lecture method which was used for the control group and the other with the cooperative method used for the experimental group. These lessons were to be taught for duration of 18 hours which covered a period of about three weeks.

Instrumentation
Two instruments were used for the study, a test (pretest/posttest) to measure to measure the development of HOTS and an observation guide to evaluate the level of cooperation among the cooperative groups. A test was administered to both groups first as pretest and later as posttest according to the domains of HOTS as spelled out in the revised Bloom's Taxonomy. Experts were contacted to formulate 2 sets of short essay type questions from the two selected areas of Practical Geography. That is from map work, and statistical techniques. Every one question comprised of three parts corresponding to the three higher domains of the Bloom's Taxonomy: analysis, evaluation and create. These questions were also constructed to reflect the standard required by the General Certificate of Education (GCE) Board. The questions were selected from the six topics summarized on the Table 2 below:

Table 2: Summary of the Topics Taught in Practical Geography

Area of Practical Geography	Topic	Duration
Map work	-Analyses of relief on topographic maps -Analyses of drainage characteristics -Analyses of vegetation on topographic maps	4 hours 4 hours 4 hours
Statistical techniques	-Measures of central tendencies -Measures of associations -Graphic techniques of data presentation	2 hours 2 hours 2 hours

An observation check list was also established to determine the level of cooperation among the learners within the various cooperative learning groups. Experts were solicited to scrutinize the pre-test and post test questions on practical geography as well as the activity items on the observation checklist that was established.

Validity of the Instrument

In order to determine the validity of the instrument used in this study, the pre- test and post- test questions formulated for this study were scrutinized by experts in measurement and evaluation in the Department of Curriculum Studies and Teaching (CST) with a background in Geography in the Faculty of Education in the University of Buea and the same instruments were given to experts in the Department of Geography in the same University for proper scrutiny of the subject content. This was to ensure that the questions measure up to the standard of HOTS stipulated by Bloom (1956) [8] and Anderson *et al* (2001) [3] as well as the standard set up by the General Certificate of Education Board (GCEB). The observation checklist on cooperative learning elements was scrutinize by the supervisor of this study with assistance from other experts in the Department of Curriculum Studies and Teaching to ascertain its correctness.

Reliability of the Instrument

In this study, the test-retest method of reliability was employed to establish the reliability of the Questions. Firstly, to establish the reliability of the instrument, a pilot study was conducted in the Lower Sixth class of GBHS Penda Mboko in the Moungo Division of the Littoral Region. Here, an intact lower sixth class of 25 students was taught for two weeks using the cooperative learning method and after which the students were administered the first test. The second was administered one week later to the same group of students. The tests lasted for 1 hour 30 minutes. After which the mean and standard deviation of the two test scores was obtained and then the Pearson correlation coefficient was used to determine the reliability of the two test scores.

Administration of the Instrument

The following five procedural steps were used to collect the data for this research.

Firstly, the researcher obtained an authorization letter from the faculty of education permitting him to collect data for the study after which he then sought permission from the schools where the study was to be conducted so that they can release their students for this experiment.

The research was conducted in Government Bilingual High School (GBHS) Great Soppo in Buea Sub Division. In this school, one intact lower sixth class was split into two halves in order to ensure that the students were operating at the same level. One served as the experimental group and the other as a control group. The experimental Group was assigned a task developed around selected topics in Practical Geography meanwhile the control group was taught the same topics using the traditional lecture method.

The researcher gave guidelines to the experimental group on how to apply the basic principles of cooperative learning especially on elements of interest such positive Interdependence, Individual Accountability and Group Processing.

Thirdly, the researcher with the help of the research assistants administered the pre-test to both the experimental and control group. First verbal explanation and instructions were given to the respondent on how to answer the questions and then the questions were administered and students were given 1-hour 30mins to answer the questions.

In the fourth stage, the researcher with the help of the research assistant administered the test instrument used as pre-test to both the experimental and control groups, this time as posttest. Verbal instructions and explanation were given to the respondent on how to answer the questions.

The observation guide was used during the treatment phase to evaluate the level of cooperation among learners of the experimental group. This guide comprised of some pre-established indicators (activities) of the three cooperative learning elements used in this study namely Positive Interdependence, Individual Accountability and Group Processing. At the end of this exercise, each group was rated according to their activities as stipulated in the observation guide. At the end of the exercise, the Level of cooperation among groups was established to find out its effects on HOTS. This was done using descriptive statistics such as mean ± SD.

To control extraneous variables, the test questions which were given as pre- test were reshuffled before given as post-test. This was to avoid the students being too familiar with the questions. The same lesson notes were used for the same cooperative learning groups in order to ensure homogeneity of the instructional conditions. Data were collected within a three-week period in order to minimize the effect of maturation and history. Experimental and control groups were kept in two separate classrooms further apart from each other in order to avoid inter group interaction. The teachers of both the control and experimental groups sat to strategize on the various methods to apply on both groups in-order to solve the issue of teacher variability. The entire process lasted for three weeks.

Procedure for Data Analysis

Data were collected and subjected to descriptive and inferential analysis. Firstly, data obtained from the study was summarized and entered into Microsoft excel spread sheet version and exported into SPSS statistical software (version 20). Both the data obtained from the pre-test and post-test results on HOTS and that obtained from the items on the observation guide were analyzed descriptively using the mean and standard deviation (mean ± SD) while at the Inferential level the t-test analysis was carried out in order to test the four hypotheses formulated for this study.

The Level of cooperation and HOTS was summarized using descriptive statistics such as mean and Standard Deviation ($\bar{x}$± SD). Differences between the scores of pretest and post test scores among the control and experimental groups were compared using the Independent T-test in order to determine the differences in the development HOTS between the two groups.

Ethical Consideration

The researcher first obtained a letter from the faculty granting him permission to carry out the study. He then sought the consent of the student participants and made the participants to understand that their participation was to be voluntary, that they were to respond to the test questions in anonymity and they were not going to reveal their personal

information other than the one needed for the research work. They were equally made to understand that their personal information revealed for the research work if any was to be kept confidential and shall not be accessed by the researcher or the supervisor for any other reason than for the purpose of the research. They were also made to understand that the results obtained from the research will be used purely for academic purpose and that findings were going to be generalized and not to be reported in individual terms. They were also assured that information they were providing was not going to render any harm to them and were made to understand that since their names were not needed, the results were not going to appear in their end of term or end of year report cards them but that the results obtained from the research was going to be communicated to them so that they could exploit it to improve on their academic work. They were made to understand that the information gathered will be kept in the library for future exploitation.

Presentation of Results

Research Question One: What is the difference in the development of HOTS in Practical Geography of students taught using cooperative learning method and those taught using the lecture method in high schools in Fako Division?

Table 3: Mean Scores and Standard Deviations for HOTS Pre-Test and Post-Test

	N	Minimum	Maximum	Sum	Mean	Std. Error	Std. Deviation
Exp. Group							
Pre Clm	50	5.00	12.00	360	7.20	.31	2.20
Post Clm	50	12.00	16.00	690	13.80	.15	1.09
Control Group							
Pre Lm	50	4.00	12.00	381	7.62	.27	1.92
Post Lm	50	1.00	18.00	572	11.44	.56	3.97
Valid N (Listwise)	50						

EXP. = Experimental, **CLM** = Cooperative Learning Method, **LM** = Lecture Method

From Table 3 above, the experimental group had a pre-test mean score of 7.20 and a standard deviation of 2.20 ($\bar{x}$=7.20±2.20) while the control group had a pre-test mean score of 7.62 and a standard deviation of 1.92 ($\bar{x}$=7.62±1.92). The results show that the two groups were almost at the same level before the experiment with a mean score difference of -0.42 in favour of the control group.

The results also show that the experimental group had a post-test mean score of 13.80 and a standard deviation of 2.20 ($\bar{x}$=13.80±1.90) while the control group had a pre-test mean score of 11.44 and a standard deviation of 3.97 ($\bar{x}$=11.44±3.97). The results shows mean score difference of 2.36 in favour of the experimental group. The experimental group had a mean score gain of 6.6 from the pre-test to the post-test, while the control group had a mean score gain of 3.82 from the pre-test to the post-test. This shows that the experimental group achieved more than the control, implying that the cooperative learning method is better than the lecture method.

Ho_1: There is no significant difference in the development of HOTS in Practical Geography of students taught using the cooperative learning and those taught using the lecture method in high schools in Fako Division.

Table 4: T-Test Analysis for HOTS Post-Test Scores for the Experimental and Control Groups

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Post Clm - Post Lm	2.36	4.19	.59	1.169	3.55	3.98	49	.00

The analysis in the Table 4 above shows that since the $t_{calculated\ score}$ = 3.980 is greater than the $t_{critical\ score}$= 1.960 with df = 49, we reject the null hypothesis and conclude that there is a significant difference in performances in HOTS of students taught practical Geography using C.L and those taught using the lecture method in high schools in Fako Division in favour of the experimental group.

Research Question Two: What is the effect of positive interdependence the development of HOTS in Practical Geography in high school students in Fako Division?

Table 5: Observations on Positive Interdependence

S. No	Positive interdependence	$\bar{X}$	S	Decision
1	Share material	3.85	.36	VG
2	paying close attention to each other	3.77	.43	VG
3	Praising and encouraging actions and ideas that are helpful	3.58	.53	VG
4	Asking and providing help when need be	3.50	.60	VG
5	making sure that everyone understands	3.57	.56	VG
6	Staying with the group	3.67	.78	VG
	MRS	3.66	.49	VG

MRS = Mean response score $\bar{x}$ = Mean score S = Standard deviation

The Table 5 above shows that from observations, the learners share materials, paying close attention to each, Praising and encouraging actions and ideas that are helpful, asking and providing help, when need be, making sure that everyone understands, and learners stay with the group. Conclusively, positive interdependence is very good and it affects the development of higher order thinking skills in practical Geography Fako Division, South west Region of Cameroon ($\bar{x}$ = 3.66±.49).

Ho_2: There is no significant effect of Positive Interdependence on the development of HOTS in Practical Geography in high school students in Fako Division.

Table 6: T-Test Analysis of Observations on positive interdependence

	Test Value = 0					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Positive interdependence	154.08	59	.000	21.93	21.64	22.22

The analysis in the Table 6 above shows that since the $t_{calculated\ score}$ = 154.08 is greater than the $t_{critical\ score}$ = 1.96 with df = 59, we reject the null hypothesis and conclude that there is a significant effect of Positive Interdependence on students' HOTS in Practical Geography in high schools in Fako Division.

Research Question Three: What is the effect of individual accountability on the development of HOTS in practical geography in high school students in Fako Division?

Table 7: Observations on individual accountability

S. No	Individual accountability	$\bar{X}$	S	Decision
1	Learners perform task individually and bring to the group	3.83	.38	VG
2	All Learners contribute something (no free ride)	3.62	.52	VG
3	Learners perform assigned roles	3.72	.49	VG
4	Every learner says something in the group	3.37	.55	VG
	MRS	3.63	.50	VG

MRS = Mean response score $\bar{x}$ = Mean score SD = Standard deviation

The Table 7 above shows that from observations, Learners perform task individually and bring to the group. All Learners contribute something (no free ride), learners perform assigned roles, every learner says something in the group. Conclusively, individual accountability is very good and it affects the development of higher order thinking skills in practical Geography Fako Division, South west Region of Cameroon ($\bar{x}$ = 3.63±.50).

Ho_3: There is no significant effect of individual accountability on the development of HOTS in Practical Geography in high school students in Fako Division.

Table 8: T-Test Analysis of Observations on Individual Accountability

	T	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Individual Accountability	142.28	59	.000	14.53	14.33	14.74

The analysis in the Table 8 above shows that since the $t_{calculated\ score}$ = 142.28 is greater than the $t_{critical\ score}$ = 1.96 with df = 59, we reject the null hypothesis and conclude that there is a significant effect of individual accountability on students' HOTS in Practical Geography in high schools in Fako Division.

Research Question Four: What is the effect of Group Processing on the development of HOTS in Practical Geography in high school students in Fako Division?

The Table 9 below describes the observations on Group Processing.

Table 9: Observations on Group Processing

S. No	Group Processing	$\bar{X}$	S	Decision
1	Learners review each other's contribution and give feedback	3.50	.50	VG
2	Learners reflect on the feedback that they have received and proposed modifications.	3.55	.59	VG
3	Learners set new objectives and take them as homework.	3.65	.55	VG
4	Learners' process previous work before the beginning of new lessons.	3.55	.50	VG
5	Learners set up new strategies on how to achieve and celebrate success.	3.83	.50	VG
	MRS	3.63	.50	VG

MRS = Mean response score $\bar{x}$ = Mean score S = Standard deviation

The Table 9 above shows that from observations, learners review each other's contribution and give feedback, learners reflect on the feedback that they have received and propose modifications, learners set up new goals in the form of homework, learners' process previous work before the beginning of new lessons, learners set up new strategies on how to achieve and celebrate success. Conclusively, Group Processing is very good and it affects the development of higher order thinking skills in practical Geography Fako Division, South west Region of Cameroon ($\bar{x}$ = 3.63±.50).

Ho_4: There is no significant effect of group processing on the development of HOTS in Practical Geography in high school students of Fako Division.

Table 10: T-Test Analysis of Observations on Group Processing

	Test Value = 0					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Group Processing	124.58	59	.000	18.08	17.79	18.37

The analysis in Table 10 shows that since the $t_{calculated\ score}$ = 124.58 is greater than the $t_{critical\ score}$= 1.96 with df = 59, we reject the null hypothsis and conclude that there is a significant effect of Group Processing in the development of HOTS in Practical Geography in high school students in Fako Division.

The analyses from the table above shows that cooperative learning skills is time saving, many students are involved at the same time, it enhances communication skills and self confidence in students, it enables equal participation; it enhances more learner' participation, class control, and social interaction; it facilitates work coverage and eases learners' understanding, it enhances learners' thinking skills and achievement in exams, ignites learners' confidence in the teacher, and increases learner's interest in the subject. Conclusively, Cooperative learning method affects the

development of higher order thinking skills in practical Geography Fako Division, South west Region of Cameroon ($\bar{x}$ = 3.12±.69).

Conclusion

In the present study students who were taught Practical Geography using the Cooperative method developed HOTS better than those who were taught using the traditional lecture method. This thus implies that when used in teaching, the cooperative learning method emerges a strong and successful approach in enhancing students' higher order thinking skills than the lecture method.

The results from the second hypothesis also indicated that positive interdependence in cooperative learning method has an effect on the development of HOTS of high school students. This implies when students work together as a team in which they put in positive energy to help each other, they are bound to achieve higher order thinking skills than when they try to compete with each other.

Furthermore, results from the testing of the third hypothesis found that individual accountability had a significant effect on the development of students HOTS in Practical Geography. This implies that when every individual student is trained to share his/her idea in a cooperative learning group, it is going to enhance the development of HOTS of the learners.

In the fourth hypothesis, it was found that group processing had a significant effect on the development of HOTS of students in Practical Geography. This is an indication that after every lesson, students sit back to reflect together on their performance by appreciating and criticizing every member's contribution. Consequently, this leads to a significant improvement in their development of HOTS not only in practical geography but also in any other subject.

The cooperative learning method therefore has been found in this study as that teaching method that can greatly enhance the development of HOTS in Practical Geography in high schools in Fako Division. If this method is to be applied efficiently in schools, teachers must strictly encourage the aspects of Positive Interdependence, Individual Accountability and Group Processing among learners.

Recommendations

The use of the cooperative learning method facilitated the development of HOTS in Practical Geography more than the use of the traditional lecture method. Hence, Geography teachers are encouraged to adopt the use of the cooperative learning method when teaching HOTS lessons in Practical Geography. Regarding the poor performance of students in Geography at the GCE advance level especially in questions that require the use of HOTS, it is highly recommended that teachers should adopt the use of cooperative learning method to address this issue not only in Practical Geography but also in the other branches of geography.

Positive Interdependence was found to be very effective in the development of HOTS in Practical Geography. Teachers should therefore emphasize and encourage the practice of this element among their learners. Learners should be encouraged to share materials among themselves, listen and praise helpful actions and ideas from their peers, seek help when need arises, check to make sure everyone understands and stay with their group during the teaching/learning process.

Since students see Practical Geography as a difficult area because of the calculation involved, teachers should encourage positive interdependence by including in every cooperative group students from the A4 series (Economics, Geography and Mathematics). Their knowledge in mathematics can boost the group's confidence in achieving their task in practical geography no matter the nature of these tasks.

If cooperative learning is effectively implemented, the burden of acquiring learning materials could be shared by learners. As such learners no matter their economic background would easily have access to any required material amongst which are calculators, mathematical sets, rulers and maps since the cost of acquiring these materials can easily be shared among the group members. In this regard every individual member would be charged with the task of acquiring just one learning material instead of everything as it is the case with the traditional lecture method.

Individual accountability was also found to be effective in the development of HOTS in Practical Geography. Teachers are encouraged to emphasize this element of cooperative learning among their learners during cooperative learning exercise to enhance the development of HOTS. During this exercise learners should be encouraged to do work first individually to bring to the group, students hand in something, perform their role on the task they have been assigned to carry out and should at least say something in the group.

In order to also ensure individual accountability in cooperative learning, parents should be encouraged to equip the students with necessary school needs that would boost their self-confidence and facilitate research so that they can be motivated to participate in lessons and offer their own contribution.

Group processing was found to be effective in enhancing HOTS in Practical geography in high school students. Hence, teachers should reinforce this element by encouraging student to always give and receive feedback on their contribution, like trying to find out from their peers the things that went on well during the lesson and things that did not. They should then find out things that should be introduced, improved upon or changed.

Students should be encouraged to analyze the feedback that they have received from their peers, set up new goals in the form of homework, process each day's work before the beginning of a new lesson and celebrate their achievement together.

Going by the positive effect of group processing in this study, it is equally recommended that Geography teachers should include guidelines or rubrics at the end of every lesson which can guide students to evaluate their work and the work of the other members after every lesson.

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